Vol. 1012 Number 1

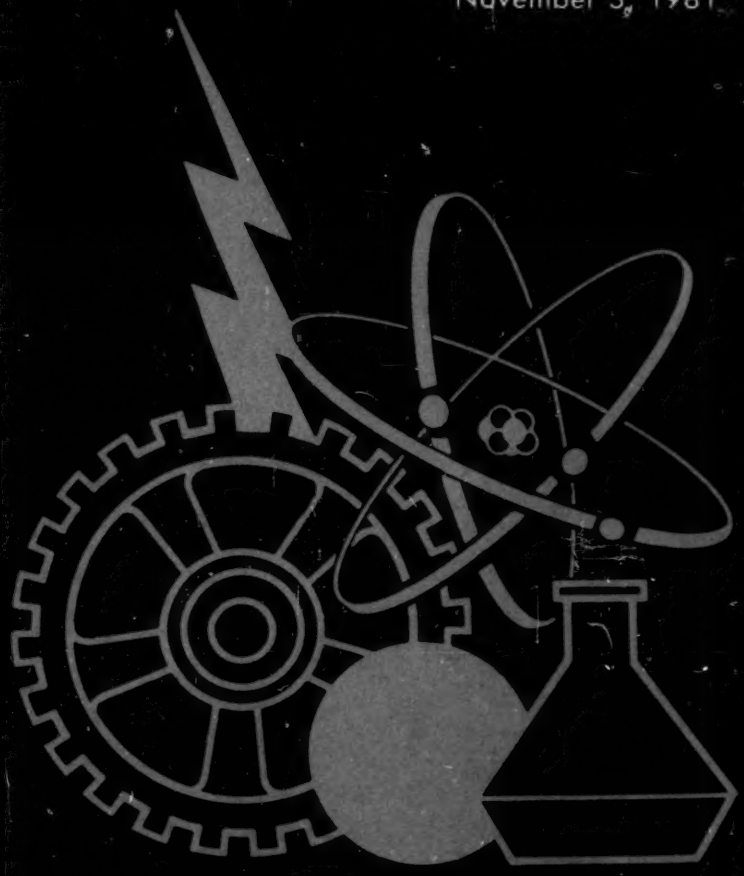
# OFFICIAL GAZETTE

of the

## UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

November 3, 1981



U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

# OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

November 3, 1981 Volume 1012 Number 1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# PATENT AND TRADEMARK OFFICE NOTICES

### Patent Cooperation Treaty Information

For information concerning the PCT, consult Chapter 1800 of the Manual of Patent Examining Procedure and notices 90–95 in the consolidated listing of notices appearing in the Official Gazette of Jan. 6, 1981.

The PCT fees in effect after May 19, 1981 are as follows:

| | |
|---|---|
| Transmittal fee | $ 35.00 |
| Search fee | 300.00 |
| International Basic Fee (for the first 30 sheets of an international application) | 215.00 |
| Basic Supplemental Fee (for each sheet over 30) | 4.00 |
| International Designation Fee (for each State for which a national patent is sought, or group of States for which the same regional patent is sought) | 50.00 |

RENE D. TEGTMEYER,
*Assistant Commissioner for Patents.*

### Board of Appeals Decisions Rendered in the Month of Sept. 1981

| | |
|---|---|
| Affirmed | 192 |
| Affirmed in Part | 23 |
| Reversed | 75 |
| Total | 290 |

### REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

**3,698,421,** Re. S.N. 276,607, Filed June 23, 1981, Cl. 137/356, VALVE ASSEMBLY, Samuel D. Kersten, Jr., et al., Owner of Record: *Water Saver Faucet Co., Chicago, Ill.*, Attorney or Agent: Sidney Wallenstein, et al., Ex. Gp.: 341

***3,713,258,*** *Re. S.N. 282,817, Filed July 13, 1981, Cl.* 52/90, BUILDING STRUCTURE, Einar Svensson, Owner of Record: *Inventor,* Attorney or Agent: John O. Graybeal, et al., Ex. Gp.: 354

**3,823,522,** Re. S.N. 277,385, Filed June 25, 1981, Cl. 52/641, HINGED CONNECTOR PLATE, John C. Jureit, et al., Owner of Record: *Automated Building Components, Inc., Miami, Fla.*, Attorney or Agent: Gary M. Hoffman, Ex. Gp.: 354

**3,906,118,** Re. S.N. 277,082, Filed June 25, 1981, Cl. 426/473, PROCESS FOR DE-BONING MEAT OR FISH, Archie Rae McFarland, Owner of Record: *Beehive Machinery, Inc., Salt Lake City, Utah,* Attorney or Agent: Phillip A. Nakkubcjridtm, et al., Ex. Gp.: 172

**4,009,126,** Re. S.N. 277,084, Filed June 25, 1981, Cl. 252/473, CATALYST FOR REMOVING ACETYLENIC IMPURITIES, Cecil G. McFarland, Owner of Record: *Petro-Tex Chemical Corp., Houston, Tex.*, Attorney or Agent: *Kenneth H. Johnson, Ex. Gp.: 223*

**4,014,758,** Re. S.N. 277,613, Filed June 24, 1981, Cl. 204/28, CONTINUOUS ELECTROLYTICAL TREATMENT OF ALUMINUM OR ITS ALLOYS, Satoshi Kawai, et al., Owner of Record: *Pilot Man-Nen-Hitsu Kabushiki Kaisha and Toyo Giken (A.K.A.) The Pilot Pen Co., Ltd., Tokyo, Japan,* Attorney or Agent: John E. Lind, et al., Ex. Gp.: 116

**4,027,335,** Re. S.N. 282,846, Filed July 13, 1981, Cl. 360/40, DC FREE ENCODING FOR DATA TRANSMISSION SYSTEM, Jerry Wayne Miller, Owner of Record: *Ampex Corp., Redwood City, Calif.*, Attorney or Agent: Joel C. Talcott, Ex. Gp.: 235

**4,157,723,** Re. S.N. 271,907, Filed June 9, 1981, Cl. 141/1, METHOD OF FORMING A CONNECTION BETWEEN TWO SEALED CONDUITS USING RADIANT ENERGY, Daniel B. Granzow, et al., Owner of Record: *Baxter Travenol Laboratories, Inc., Deerfield, Ill.,* Attorney or Agent: Paul C. Flattery, et al., Ex. Gp.: 243

**4,159,370,** Re. S.N. 277,391, Filed June 25, 1981, Cl. 526/73, POLYTETRAFLUOROETHYLENE FINE POWDER AND PROCESS FOR PRODUCING THE SAME, Shun Koizumi, et al., Owner of Record: *Daikin Kogyo Co., Ltd., Osaka-Shi, Japan,* Attorney or Agent: Raymond C. Stewart, et al., Ex. Gp.: 144

**4,172,486,** Re. S.N. 273,691, Filed June 15, 1981, Cl. 152/185.1 APPARATUS FOR CLEANING A TRACK ASSEMBLY, Robert N. Stedman, et al., Owner of Record: *Caterpillar Tractor Co., Peoria, Ill.,* Attorney or Agent: Frank L. Hart, et al., Ex. Gp.: 161

**4,184,252,** Re. S.N. 278,260, Filed June 29, 1981, Cl. 433/172, OVERDENTURE AND METHOD FOR SECURING SAME, Arthur J. Krol, et al., Owner of Record: *Arthur J. Krol, San Francisco, Calif.*, Attorney or Agent: Arthur J. Krol, et al., Ex. Gp.: 333

**4,190,859,** Re. S.N. 283,047, Filed July 13, 1981, Cl. 358/128.5, TRACKING CONTROL APPARATUS FOR USE IN APPARATUS FOR REPRODUCING VIDEO SIGNALS FROM A ROTARY RECORDING MEDIUM, Hisao Kinjo, Owner of Record: *Victor Co., of Japan, Ltd., Yokohama-City, Japan,* Attorney or Agent: Louis Bernat, Ex. Gp.: 235

**4,227,849,** Re. S.N. 272,271, Filed June 10, 1981, Cl. 414/408, A REFUSE COLLECTION DEVICE, Wayne H. Worthington, (Deceased), by Stanley W. Worthington, Executor, Owner of Record: *Inventor,* Attorney or Agent: H. Robert Henderson, et al., Ex. Gp.: 314

**4,253,356,** Re. S.N. 284,382, Filed July 17, 1981, Cl. 81/177.005, SOCKET WRENCH WITH INTERCHANGEABLE SOCKETS STORED IN HANDLE, Werner W. Martinmaas, Owner of Record: *Inventor,* Attorney or Agent: Ernest A. Wegner, et al., Ex. Gp.: 323

**4,261,344,** Re. S.N. 282,087, Filed July 10, 1981, Cl. 128/6, COLOR ENDOSCOPE, William C. Moore, et al., Attorney or Agent: Welch Allyn, Inc., Skaneateles Falls, N.Y., Attorney or Agent: Richard von K. Bruns, et al., Ex. Gp.: 335

### REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

**Re. 27,330,** Reexam. No. 90/000,080, Requested: Oct. 5, 1981, Cl. 220/437, THERMALLY INSULATED TANK STRUCTURE, Emil G. Marcmann, Owner of Record: *Theracon Industries, Inc., Cherry Hill, N.J.,* Attorney or Agent: CYR & DuPont, Ex. Gp.: 240, Requester: TPCO, Inc., Monmouth Junction, N.J.

**3,472,011,** Reexam. No. 90/000,069, Requested: Sept. 9, 1981, Cl. 57/290, TREATMENT OF ARTIFICIAL YARNS AND THREADS, Ernest P. R. Scragg, Owner of Record: *Lex Tex Ltd., Inc.,* Attorney or Agent: Oblon, Fisher, Spivak, McClelland & Maier, Ex. Gp.: 244, Requester: Glen Raven Mills, Inc., et al., c/o Cushman, Darby & Cushman, Washington, D.C.

**3,502,645,** Reexam. No. 90/000,078, Requested: Sept. 30, 1981, Cl. 260/158, WATER-INSOLUBLE BENZOTHIAZOLE MONOAZO DYES, Duncan G. Carmichael, Owner of Record: *Martin Marietta Corp.,* Attorney or Agent: Wilton Rankin, Ex. Gp.: 110, Requester: George E. Oram, Washington, D.C.

**3,651,418,** Reexam. No. 90/000,079 Requested: Oct. 2, 1981, Cl. 329/50, SYNCHRONOUS DETECTOR CONTROL, Erwin Johann Wittmann, Owner of Record: *RCA Corp.,* Attorney or Agent: Eugene M. Whitacre, Ex. Gp.: 252, Requester: RCA Corp., Princeton, N.J.

**4,110,240,** Reexam. No. 90/000,075, Requested: Sept. 25, 1981, Cl. 252/182, COPRECIPITATION PROCESS, Thomas J. Leo, et al., Owner of Record: *Wyrough & Loser, Inc., Trenton, N.J.,* Attorney or Agent: James R. Laramie, Ex. Gp.: 220, Requester: Harold C. Wegner, Washington, D.C.

**4,182,460,** Reexam. No. 90/000,076, Requested: Sept. 28, 1981, Cl. 220/271, LEVER ACTION TAB SYSTEM FOR EASY OPENING ENDS, A. J. Holk, et al., Owner of Record: *The Continental Group, Inc., New York, N.Y.,* Attorney or Agent: Charles E. Brown, Ex. Gp.: 240, Requester: Boise Cascade Corp., c/o L. E. Laubscher, Sr., Arlington, Va.

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## DEPARTMENT OF COMMERCE

### Patent and Trademark Office

### 37 CFR Part 2

### Trademark Applications; Filing Dates

**AGENCY:** Patent and Trademark Office, Commerce.

**ACTION:** Proposed rulemaking.

**SUMMARY:** Patent and Trademark Office proposes amendments of the rules of practice in trademark cases to revise the filing date requirements for an application for registration of a mark and to allow the Office to return applications which fail to meet these requirements. The amendments also define with additional specificity the nature of the drawing and specimens which must accompany an application in order for it to be entitled to a filing date. The proposed amendments are needed to reduce the special handling required to process and control applications not entitled to a filing date and the impact of such special handling on delaying other applications. Delays in application processing also occur when drawings fail to include a complete heading and Office personnel must enter the necessary data on a large volume of drawings. The proposed amendments are designed to speed the initial processing of applications and the filing of copies of drawings in the Trademark Search Room. An additional effect of the amendments would be a significantly earlier notification to an *applicant of the status of papers filed as an application* for registration of a trademark.

**DATE:** Written comments by January 5, 1982.

**ADDRESSES:** Address written comments to the Commissioner of Patents and Trademarks, Washington, D.C. 20231. Written comments will be available for public inspection in Room 11E10 of Building 3, Crystal Plaza, 2021 Jefferson Davis Highway, Arlington, Virginia.

**FOR FURTHER INFORMATION CONTACT:** Ms. Paula Hairston by telephone at [703]557-7464 or by mail marked to her attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

**SUPPLEMENTARY INFORMATION:** The Patent and Trademark Office is considering amendments to the rules of practice in trademark cases to amend the requirements for receiving a filing date for an application for registration of a mark, to revise the procedures for returning papers which are not entitled to receive a filing date, to amend the requirements for a drawing submitted as part of an application, to delete the provisions for the Patent and Trademark Office to make or correct drawings for applications to register marks and to specify that a copy of a drawing is not acceptable as a facsimile showing how a mark is actually used in commerce.

The specific rules for which amendments are proposed are §§2.21, 2.52, 2.54, and 2.57. In addition, it is proposed to remove §2.55.

Section 2.21 is proposed to be amended by revising paragraphs (a) and (c). The effect of revising paragraph (a) will be to make the heading a mandatory portion of the drawing of the mark. The result will be the denial of a filing date for an application when the drawing submitted as apart of the application lacks the information required to be in the heading, namely, the applicant's full name and postal address, the date of first use of the mark, the date of first use of the mark in commerce (except for an application filed under §44 of the Trademark Act), and the goods or services identified in the application, or a typical item of goods or services if a number of items are recited in the application. At present, if a drawing is submitted without a heading, or with an incomplete heading, an employee of the Service Division of the Trademark Examining Operation must type the information on the drawing before copies can be reproduced for filing in the Search Room for use by examiners and the general public. Because the applications are batched in numerical order for processing purposes, this added typing delays the processing, not only of the application directly involved, but also of all the applications with later serial numbers. Consequently, the submission of drawings with missing or incomplete headings affects other applicants and contributes to unnecessary delays in sending out filing receipts and in transmitting applications to the examiners.

It is also proposed to remove the words "or other identification" from existing paragraph (a) because they have *no meaning.*

Paragraph (c) of §2.21 is proposed to be amended to change the procedure for dealing with applications that are so defective, i.e. that do not satisfy the requirements of §2.21(a), that they are not entitled to a filing date.

The procedure within the Patent and Trademark Office under existing §2.21(c) is that all incoming mail is date-stamped in the mail room. All papers submitted as applications for the registration of marks are given serial numbers and are then sent to the Finance Branch for the collection of the fees submitted. After the papers are annotated to show the fee submitted, the papers are returned to the mail room, which sends them to the Classification Team of Trademark Service Division for review. If any application fails to satisfy the requirements of §2.21(a), the applicant or his attorney is notified of the defect and allowed six months to correct it. In the meantime, the papers and fee are held in the Office. The time that elapses between the receipt of application pa*pers in the Office and the dispatch of a letter notifying* the applicant or his attorney that the application is not *entitled to receive a filing date is approximately three to* four weeks and occasionally longer.

If the defect is remedied within the six months allowed, the application is given an effective filing date as of the date when all of the requirements of §2.21(a) are fulfilled. If the requirements for receiving a filing date are not satisfied, the fee, the drawing, and the re-

maining application papers are normally returned. Application papers which, when originally filed, are not entitled to receive a filing date impose extra handling burdens and costs upon the Patent and Trademark Office.

Under the proposed procedure, papers submitted as an application for registration of a mark will be reviewed immediately after their receipt in the mail room of the Patent and Trademark Office. Papers which are so defective that they are not entitled to receive a filing date will be returned to the applicant or his attorney together with any fee that was submitted. The papers will be accompanied by a letter describing the defect or defects. The applicant or his attorney will thus be notified that an application is not entitled to a filing date within about ten days from the date when the defective papers were received. This change will be beneficial to such applicants because they will be notified of, and hence have the opportunity to correct, defects in applications at an earlier time than is possible under existing §2.21(c), and, therefore, obtain an earlier effective filing date, than is now possible. The change will also benefit other applicants by reducing the burden and costs of the Patent and Trademark Office which adversely affect the handling of their applications.

In the event that the applicant resubmits the original application papers together with any additional paper, specimen, drawing, or fee which is required to correct the defect in the original papers, the Patent and Trademark Office will exercise reasonable discretion in determining whether the lapse of time between the date of execution of the application and the receipt in the Office of the corrected papers requires reexecution of the application. A requirement by the examiner that the application be reexecuted will not affect the filing date. See §2.32(b).

It should be noted that the certificate of mailing procedure, 37 CFR 1.8, does not apply to the filing of trademark applications and therefore does not apply to the filing of a resubmitted trademark application. This is not a change from current practice.

Section 2.52 is proposed to be amended by revising paragraph (d) to make it mandatory to include on every drawing submitted as part of an application the identifying information prescribed by the rule. Specifically, "must" is substituted for "should" in the present rule. The reason for this proposed amendment is explained above in the explanation of the amendment proposed for §2.21(a).

Section 2.54 is proposed to be amended to bring this section into conformity with the proposed amendments of §§2.21(a) and 2.52 by excluding an omitted or incomplete heading as a defect which is remediable by amendment after an examiner issues an Office action. Section 2.54 is also proposed to be amended by eliminating the provision for correction of drawings by the Office. The provision is being eliminated because of the lack of facilities.

Section 2.55 is proposed to be removed because the official draftsman of the Office does not have the facilities for making drawings for applications to register marks.

Section 2.57 is proposed to be amended by adding new paragraph (b) to make it clear that a mere reproduction of the drawing by xerographic, photographic or other copying processes will not be accepted as a facsimile showing how the mark is actually used in commerce (or is actually used in the case of an application filed under section 44 of the Trademark Act). No change is being made in the requirement that a facsimile submitted in lieu of a specimen must clearly and legibly show the mark and all matter used in connection therewith as the mark is actually used.

The Patent and Trademark Office has determined that the proposed—amendments are not major rules under Executive Order 12291 since they would benefit trademark applicants and reduce the burdens on the Office.

The proposed amendments will not have a significant adverse economic impact on a substantial number of small entities. (Regulatory Flexibility Act, 5 U.S.C. 601 *et seq.*)

Notice is hereby given that pursuant to the Commissioner's authority under Section 41 of the Trademark Act of July 5, 1946, 15 U.S.C. 1123, and Section 6 of the Act of July 19, 1952, 35 U.S.C. 6, the Patent and Trademark Office proposes to amend Part 2 of Title 37 of the Code of Federal Regulations as set forth below.

In the text of the proposed amendments, additions are indicated by arrows and delections are indicated by brackets.

It is proposed to amend 37 CFR, Part 2 as follows:

## PART 2—RULES OF PRACTICE IN TRADEMARK CASES

1. Section 2.21 is proposed to be revised to read as follows:

**§2.21 Requirements for receiving a filing date.**

(a) Materials submitted as an application for registration of a mark will not be accorded a filing date as an application until all of the following elements are received:

(1) Name of the applicant;

(2) A name and address to which communications can be directed;

(3) A drawing [or other identification] of the mark sought to be registered [;] ►containing the information required by paragraph (d) of §2.52;◄

(4) An identification of goods or services;

(5) At least one specimen or facsimile of the mark as actually used;

(6) A date of first use of the mark in commerce, or a certification or certified copy of a foreign registration if the application is based on such foreign registration pursuant to section 44(e) of the [act,] ►Trademark Act,◄ or a claim of the benefit of a prior foreign application in accordance with section 44(d) of the Act;

(7) The required filing fee for at least one class of goods or services. Compliance with one or more of the rules relating to the elements specified above may be required before the application is further processed.

(b) The filing date of the application is the date on which all of the elements set forth in paragraph (a) of this section are received in the Patent and Trademark Office.

(c) If the papers [are so defective that they cannot be accepted, the applicant will be notified and the papers and fee held 6 months. If the requirements for receiving a filing date have not been satisfied within such time, the papers and fee will be returned to the applicant or otherwise disposed of; the drawing or fee of an unaccepted ► applicant may be transferred to a later application.] and fee submitted as an application do not satisfy all of the requirements specified in paragraph 9a) of this section, the papers will not be considered to constitute an application and will not be given a filing date. The Patent and Trademark Office will return the papers and any fee submitted therewith to the person who submitted the papers. The Office will notify the person to whom the papers are returned of the defect or defects which prevented their being considered to be an application.◄

2. Section 2.52 is proposed to be amended by revising paragraph (d) to read as follows:

**§2.52 Requirements for drawings.**

* * * * *

(d) *Heading.* Across the top of the drawing, beginning one inch (2.5 cm.) from the top edge and not exceeding one-fourth of the sheet, there [should] ►must◄ be placed a heading, listing in separate lines applicant's ► complete◄ name, applicant's post office address, the date [s] of first use of the mark, the date of first use of ► the mark in commerce (except for an application filed under section 44 of the Trademark Act),◄ and the goods or services recited in the application [(]►or◄ a

typical item of the goods or services if a number ►of items◄ are recited in the application [)]. This heading [may] ► should ◄ be typewritten.

* * * * *

3. Section 2.54 is proposed to be revised to read as follows:

**§2.54 Informal drawings.**

A drawing not in conformity with [§§2.51 to 2.53]► §2.51 or paragraphs (a), (b), (c), or (e) of §2.52 or §2.53 may be accepted for purposes for examination, but the drawing must be corrected or a new one furnished, as required, before the mark can be published or the application allowed. [The necessary corrections will be made by the Patent and Trademark Office upon applicant's request and at his expense.]

4. Section 2.55 is proposed to be removed.

**[§2.55 Patent and Trademark Office may make drawings.**

The Patent and Trademark Office, at the request of applicants and at their expense, will make drawings if facilities permit.]

5. Section 2.57 is proposed to be revised as follows:

**§2.57 Facsimiles.**

►(a)◄ When, due to the mode of applying or affixing the trademark to the goods, or to the manner of using the mark on the goods, or to the nature of the mark, specimens as above stated cannot be furnished, five copies of a suitable photograph or other acceptable reproduction, not to exceed 8½ inches (21.6 cm.) wide and 13 inches (33.0 cm.) long, and clearly and legibly showing the mark and all matter used in connection therewith, shall be furnished.

►(b) A purported facsimile which is merely a reproduction of the drawing submitted to comply with §2.51 will not be considered to be a facsimile depicting the mark as actually used on or in connection with the goods or in connection with the services.

Dated: August 27, 1981.
Gerald J. Mossinghoff,
*Commissioner of Patents and Trademarks.*

Approved: September 2, 1981.
Robert B. Ellert,
*Acting Assistant Secretary for Productivity, Technology and Innovation.*

[FR Doc. 81-39154 Filed 10-7-81; 8:45 a.m]
BILLING CODE 3560-31-M

# PATENT NOTICES

**Certificates of Correction for the Week of Nov. 3, 1981,**

| | | | |
|---|---|---|---|
| D. 258,109 | 4,239,059 | 4,265,719 | 4,280,821 |
| D. 259,089 | 4,239,060 | 4,265,723 | 4,281,008 |
| D. 259,090 | 4,239,507 | 4,265,788 | 4,281,028 |
| D. 259,512 | 4,241,405 | 4,265,824 | 4,281,396 |
| 3,800,239 | 4,242,621 | 4,266,065 | 4,281,419 |
| 4,031,304 | 4,245,031 | 4,266,611 | 4,281,655 |
| 4,047,029 | 4,245,281 | 4,266,752 | 4,281,707 |
| 4,068,298 | 4,245,332 | 4,266,964 | 4,281,715 |
| 4,073,784 | 4,245,870 | 4,267,447 | 4,281,730 |
| 4,075,221 | 4,246,895 | 4,269,497 | 4,282,179 |
| 4,107,196 | 4,247,494 | 4,269,722 | 4,282,441 |
| 4,107,387 | 4,247,862 | 4,269,761 | 4,282,644 |
| 4,132,915 | 4,247,903 | 4,270,126 | 4,282,930 |
| 4,137,876 | 4,248,857 | 4,270,729 | 4,283,200 |
| 4,140,850 | 4,251,159 | 4,271,042 | 4,283,290 |
| 4,145,351 | 4,251,269 | 4,271,074 | 4,283,350 |
| 4,149,178 | 4,251,687 | 4,271,294 | 4,283,355 |
| 4,168,886 | 4,253,232 | 4,271,430 | 4,283,691 |
| 4,174,830 | 4,253,303 | 4,271,506 | 4,283,955 |
| 4,175,158 | 4,254,044 | 4,273,600 | 4,284,371 |
| 4,179,211 | 4,254,506 | 4,274,604 | 4,284,561 |
| 4,192,217 | 4,254,668 | 4,274,718 | 4,284,640 |
| 4,196,134 | 4,255,210 | 4,274,832 | 4,284,661 |
| 4,197,444 | 4,255,711 | 4,275,106 | 4,284,701 |
| 4,200,252 | 4,256,402 | 4,275,644 | 4,284,733 |
| 4,202,781 | 4,256,844 | 4,275,768 | 4,284,941 |
| 4,205,894 | 4,257,096 | 4,276,234 | 4,285,187 |
| 4,210,147 | 4,257,400 | 4,276,394 | 4,285,248 |
| 4,213,681 | 4,257,833 | 4,276,407 | 4,285,639 |
| 4,216,035 | 4,257,863 | 4,276,436 | 4,285,689 |
| 4,219,455 | 4,259,007 | 4,277,315 | 4,285,846 |
| 4,219,613 | 4,259,450 | 4,277,745 | 4,285,945 |
| 4,220,700 | 4,259,565 | 4,277,917 | 4,286,255 |
| 4,221,988 | 4,259,937 | 4,277,967 | 4,286,411 |
| 4,223,077 | 4,260,496 | 4,278,431 | 4,286,422 |
| 4,225,660 | 4,262,004 | 4,278,434 | 4,286,431 |
| 4,226,271 | 4,262,114 | 4,278,445 | 4,286,840 |
| 4,226,824 | 4,262,208 | 4,278,758 | 4,287,074 |
| 4,226,856 | 4,262,314 | 4,279,423 | 4,287,740 |
| 4,227,599 | 4,262,683 | 4,279,478 | 4,288,066 |
| 4,230,112 | 4,262,830 | 4,279,563 | 4,288,314 |
| 4,231,852 | 4,263,409 | 4,279,800 | 4,289,309 |
| 4,231,871 | 4,264,129 | 4,279,881 | 4,289,426 |
| 4,234,549 | 4,264,319 | 4,279,993 | 4,289,941 |
| 4,237,216 | 4,264,520 | 4,280,267 | |
| 4,237,788 | 4,265,235 | 4,280,390 | |
| 4,238,753 | 4,265,596 | 4,280,617 | |

**Adverse Decisions in Interference**

In the designated interference involving the indicated claims of the following patents, final decisions having been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,696,276, B. W. Boland, INSULATED GATE FIELD-EFFECT DEVICE AND METHOD OF FABRICATION, Interference No. 99,779, decided June 17, 1981, claims 1, 2, 4 and 6.

Patent No. 3,832,243, H. C. Donkersloot and J. H. N. van Vucht, SHAPE MEMORY ELEMENTS, Interference No. 100,281, decided Aug. 13, 1981, claims 1–3 and 5.

Patent No. 4,024,083, M. S. Kablaoui and J. B. Biasotti, SUBSTITUTED PHENOXY PROPANOL DIAMINES AND AMINO ALCOHOL DETERGENT ADDITIVES FOR FUELS AND MINERAL OILS, Interference No. 100,430, decided Sept. 16, 1981, claims 1, 3, 4, 7 and 8.

Patent No. 4,024,245, M. M. Hoehn and K. H. Michel, ANTIBIOTIC A-30912 AND PROCESS FOR PRODUCTION THEREOF, Interference No. 100,071, decided July 20, 1981, claims 1 and 2.

Patent No. 4,029,150, E. M. Goodsell, Jr., SPRINKLER, Interference No. 99,811, decided Oct. 8, 1980, claims 1, 2, 4–7.

Patent No. 4,073,094, R. A. Walz, METHOD AND APPARATUS FOR REPAIRING A CRACK IN A PANE OF PLATE GLASS, Interference No. 100,020, decided June 9, 1981, claims 1, 2, 4, 5, 6 and 8.

Patent No. 4,111,788, M. C. Chervenak and E. S. Johanson, STAGED HYDROGENATION OF LOW RANK COAL, Interference No. 100,462, decided July 20, 1981, claims 1–9, 11–15, 18 and 21.

Patent No. 4,119,343, F. R. Pentzien, PLATFORM ROCKER STRUCTURE, Interference No. 100,609, decided Aug. 31, 1981, claims 1, 2 and 3.

Patent No. 4,173,575, J. T. Carlock, POLYMER BOUND (PENTAHAPTOCYCLOPENTADIENYL) BIS CARBONYL RHODIUM HYDROFORMYLATION CATALYST, Intereference No. 100,598, decided Aug. 13, 1981, claims 1–9.

NANNIE B. HENRY,
*Deputy Clerk,*
*Board of Patent Interferences.*

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The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

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Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

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| | Cleveland Public Library | (216) 623-2870 |
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**CONDITION OF PATENT APPLICATIONS AS OF September 5, 1981**

| PATENT EXAMINING GROUPS | Actual Filing Date of Oldest New Case Awaiting Action |
|---|---|
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| GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices. | 5-12-80 |
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| COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography. | 1-12-80 |
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| ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring. | 4-20-79 |
| DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts. | 2-08-80 |
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| GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches. | 2-19-80 |

**Expiration of patents**: The patents within the range of numbers indicated below expire during September 1981, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,146,459 to 3,151,328, inclusive

Plant Patents ..... Numbers 2,444 to 2,448, inclusive

# DEFENSIVE PUBLICATIONS

## PUBLISHED NOVEMBER 3, 1981

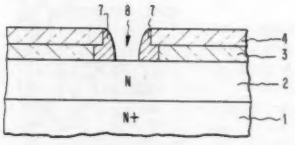
Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

### T101,201
### METHOD FOR MAKING STABLE NITRIDE-DEFINED SCHOTTKY BARRIER DIODES

**Narasipur G. Anantha, 1 Valdemar Rd., Hopewell Junction, N.Y. 12533, and Harsaran S. Bhatia, 41 Tor Rd., Wappingers Falls, N.Y. 12590**

**Continuation of Ser. No. 133,069, Mar. 24, 1980, abandoned. This application Apr. 14, 1981, Ser. No. 254,039**
**Int. Cl.³ H01L *21/308***
**U.S. Cl. 156—643**
**1 Sheets Drawing. 9 Pages Specification**




Excessive leakage after initial forward stress, exhibited by subsequently reverse stressed nitride defined, Schottky barrier diodes is solved by the elimination of the "mouse hole" or undercut cavity in the oxide layer beneath the nitride ring defining the Schottky contact to the underlying silicon. The aforementioned cavity is filled by depositing chemical vapor deposited (CVD) oxide onto the nitride layer, into the nitride ring and the undercut oxide cavity beneath the ring and onto the underlying silicon substrate exposed through the nitride ring. The CVD oxide is then reactively ion etched to remove it except along the vertical walls of the nitride ring and the oxide cavity. The Schottky metal is deposited on the silicon substrate exposed by the reactive ion etching step.

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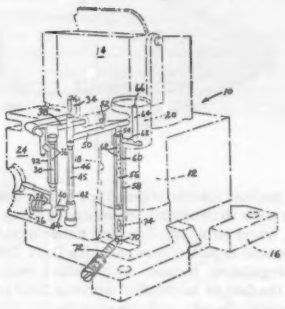
### T101,202
### CARBURETOR IDLE SYSTEM AIR/FUEL RATIO CONTROL

**John H. Furbacher, 21559 Military; Edwin K. Ratledge, 307 S. Vernon, both of Dearborn, Wayne County, Mich. 48124, and Richard A. Ullmann, 8616 Nancy, Macomb County, Utica, Mich. 48087**

**Continuation of Ser. No. 82,351, Oct. 5, 1979, abandoned. This application Dec. 23, 1980, Ser. No. 219,558**
**Int. Cl.³ F02M *7/02***
**U.S. Cl. 261—41 D**
**1 Sheets Drawing. 13 Pages Specification**

A carburetor is provided with a separate idle air/fuel system containing an idle fuel metering jet or orifice; and an idle fuel tube connected to an induction passage discharge port downstream of the throttle valve, the idle fuel tube being surrounded or enclosed near the discharge end by an air well connected to a main air bleed, this portion of the idle tube having air bleed holes for mixing air with the fuel to provide acceptable driveability during idle speed operation, the diameter of the holes being mathematically calculatable to vary in a direct relation to the size of the idle metering jet and in an inverse relation to the diameter of the idle air well tube, to provide an essentially



constant air/fuel ratio to the idle mixture flow upon changes in either the idle jet size or the idle tube size.

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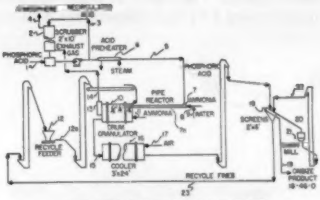
### T101,203
### PROCESS FOR PRODUCTION OF GRANULAR DIAMMONIUM PHOSPHATE

**Byron R. Parker, Rte. 7, Box 117, Florence, Ala. 35630, and Melvin M. Norton, Rte. 1, Virginia Shores, Sheffield, Ala. 35660**

**Filed Oct. 23, 1980, Ser. No. 199,795**
**Int. Cl.³ C05B *7/00*; C05C *9/00***
**U.S. Cl. 71—29**
**4 Sheets Drawing. 25 Pages Specification**



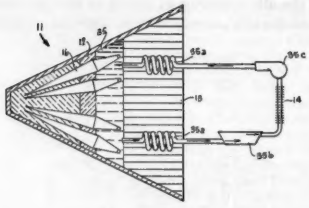

FLOW DIAGRAM OF GRANULATION PILOT PLANT FOR PRODUCTION OF DIAMMONIUM PHOSPHATE USING THE PIPE REACTOR

Process for production of diammonium phosphate from orthophosphoric acid and ammonia. A specially designed inline reactor, a pipe reactor, is used to produce a homogeneous slurry with a lower moisture content than can be produced and pumped utilizing a preneutralizer as used in many prior-art granular fertilizer processes. Because of the lower moisture content of the slurry, drying requirements are eliminated. This eliminates two items of equipment, to wit, a preneutralizer and a dryer, and greatly simplifies pollution abatement since both items are sources of fumes and dust. The equipment utilized in the present process is inexpensive and simple to operate. The products produced are dust-free and of such particle size distribution that they are well suited for subsequent use in producing bulk blends.

**T101,204**
**COMPACT FAST NUCLEAR REACTOR USING HEAT PIPES**

**Viktor E. Hampel, 2783 Curlew Ct., Pleasanton, Calif. 94566**

**Filed Oct. 16, 1980, Ser. No. 197,464**
**Int. Cl.[3] G21C *15/00***
**U.S. Cl. 376—221**
**7 Sheets Drawing. 35 Pages Specification**



A fast nuclear reactor is described which comprises a conical reactor core surrounding an embedded array of heat pipes of, per se, novel structure, carrying either moderator or nuclear fuel material as part of their working fluid. This reactor system is self-regulating, because an excessive increase in reactivity drives the fuel or moderator working fluid out of the conical core region, thereby reducing reactivity. The heat pipes are protected against burnout by a novel heat pipe envelope shape and internal wicking structure designed to increase the working fluid circulation speed with increasing heat transfer loads.

**T101,205**
**MOLDING PROCESS**

**Gordon K. Goulder, 404 Claymore Dr., Kingsport, Tenn. 37663, and Edward R. Hollander, Jr., Rte. 13, 213 Montezuma Rd., Kingsport, Tenn. 37664**

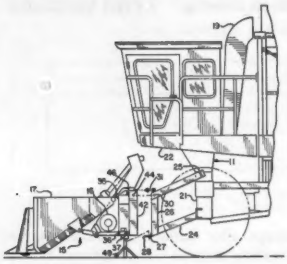
**Filed Jan. 26, 1981, Ser. No. 228,415**
**Int. Cl.[3] B29C *17/07***
**U.S. Cl. 264—523**
**No Drawing. 6 Pages Specification**

A process of forming a polyethylene terephthalate container in which the container is biaxially oriented simultaneously with being blow-molded. The container is allowed to remain in the blow mold having a surface temperature between about 150° C. and about 250° C. for a time sufficiently long to result in the container reaching a crystallinity of at least 30% while the pressure is simultaneously maintained above atmosphere inside the container to prevent collapse thereof. The process enhances dimensional stability at temperatures sufficiently high to normally cause shrinkage of the container.

**T101,206**
**COTTON HARVESTER**

**Horace E. Ralston, 7260 Locke Rd., Millington, Tenn. 38053, and Jesse H. Orsborn, 5836 Bentley, Clarendon Hills, Ill. 60514**

**Filed Nov. 21, 1980, Ser. No. 208,913**
**Int. Cl.[3] A01D *35/12, 47/00, 41/00***
**U.S. Cl. 56—15.6**
**2 Sheets Drawing. 8 Pages Specification**



Apparatus for attaching a harvesting header to the vertically fixed subframes of a cotton harvester chassis including apertured horizontal header frame support plates extending forwardly from the lower portion of the subframes, latch pins on the header for engaging the apertures, linear adjustable drawing members releasably interconnecting the upper portion of the header to the upper portion of the subframe, and a pair of spaced vertical plates extending rearwardly from the header and intermeshing with a vertical interface member on the subframe, preferably being pinned thereto for operation of the harvester.

# REISSUES

## NOVEMBER 3, 1981

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

### Re. 30,786
### DISPOSABLE IDENTIFICATION BAND BLANK

**Gerald L. Wiebe, 53 E. St. Charles Rd., Villa Park, Ill. 60181**

**Original No. 4,078,324, dated Mar. 14, 1978, Ser. No. 646,365, Jan. 2, 1976. Continuation of Ser. No. 464,750, Apr. 29, 1974, abandoned. Application for reissue Nov. 2, 1978, Ser. No. 957,148**

**Int. Cl.³ G09F *3/14***

**U.S. Cl. 40—21 C** **32 Claims**

1. A disposable identification band blank adapted for inscription and subsequent application to a patient's limb which is a laminated, elongated, flexible body terminating in overlappable extremities and comprising a base strip of flexible non-irritating material; a first adhesive coating on one side of the base strip; a segment of pressure-sensitive record material means displaying a distinctive color when subjected to localized pressure superposed on and adhesively bonded to a central portion of the base strip; a flexible, transparent cover strip coextensive with said base strip and adhesively secured to said base strip; a second adhesive coating on at least a central portion of the cover strip surface which faces said segment of pressure-sensitive record material means and adhesively bonding the central portion of the cover strip to said segment of a pressure-sensitive record material means and to said base strip; and adhesive attachment means on at least one of said band extremities for adhesively bonding overlapping portions of the band extremities; said adhesive attachment means comprising a third adhesive coating on an overlapping face of one of said extremities and at least one release sheet segment having dual release surfaces at the other of said extremities and being removably disposed between said base strip and said cover strip; said third adhesive coating being situated on an overlapping face of the base strip at said extremities and covered with a release sheet substantially coextensive therewith; and said release sheet covering said third adhesive coating being more rigid than the extremity bearing said third adhesive coating.

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### Re. 30,787
### HAND HELD MASKING MACHINE

**Danny L. Pool, 2025 E. Jackson, Phoenix, Ariz. 85034, and Robert R. Pool, 607 E. Franklin, Mesa, Ariz. 85204**

**Original No. 4,096,021, dated Jun. 20, 1978, Ser. No. 778,704, Mar. 17, 1977. Application for reissue Jun. 27, 1979, Ser. No. 53,113**

**Int. Cl.³ B32B *31/08***

**U.S. Cl. 156—527** **7 Claims**

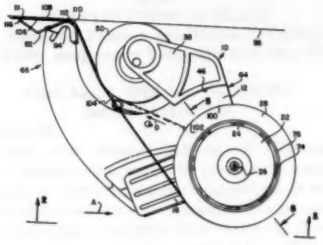
*13. A hand held masking machine comprising:*

*a substantially flat frame having an outer and an inner side, and front, central and rear portions;*

*an offset to the flat frame member connected to the central portion and displaced in the direction of the outer side of the frame;*

*a tape roll holder mounted on the outer side of the rear portion of the frame for rotation about a first axis of rotation, said tape roll holder adapted to have a roll of masking tape mounted on the tape roll holder, each roll of masking tape adapted to be mounted on the tape roll holder having a width and an outer edge, the width of each such roll of masking tape not necessarily being the same so that the distance of the outer edge of the tape from the outer side of the frame is a function of the width of the tape;*

*a paper roll holder mounted on the offset for rotation about a second axis of rotation, said first and second axes of rotation being substantially parallel but displaced from one another, said paper roll holder adapted to have a roll of paper mounted thereon for rotation about the second axis of rotation, said paper roll holder being mounted on the offset so that the majority of the width of a roll of paper mounted thereon is positioned beyond the inner side of the frame, said paper roll being positioned so that the tape dispensed from a roll of tape mounted on the tape roll holder overlaps an edge of the paper dispensed from a roll of paper mounted on the paper roll holder;*



*a handle bracket mounted on the central portion of the frame and extending in a direction substantially parallel to the second axis of rotation and away from the inner side of the frame;*

*a handle secured to the handle bracket, said handle being positioned so that the hand of the user of the masking machine gripping the handle is spaced from the inner side of the frame;*

*guide bar mounting means formed at the front portion of the frame; and*

*a guide bar having a tape end adjustably mounted on the guide bar mounting means so that the tape end of the guide bar can be positioned to substantially be aligned with the outer edge of the tape positioned on the tape roll holder.*

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### Re. 30,788
### Patent Not Issued For This Number

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### Re. 30,789
### PROCESS FOR COATING SHEET SUBSTRATES WITH THERMOPLASTIC POLYMER

**James F. Pilgrim, Glenburnie, and Ronald A. Hunter, Amherstview, both of Canada, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

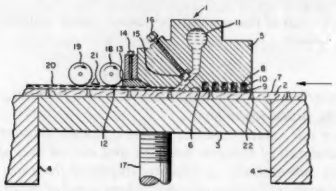
**Original No. 4,143,187, dated Mar. 6, 1979, Ser. No. 856,506, Dec. 1, 1977. Application for reissue Nov. 26, 1979, Ser. No. 97,234**

**Int. Cl.³ B05D *3/12***

**U.S. Cl. 427—358** **7 Claims**

*15. In a process for coating a substantially inflexible sheet*

*substrate with a coating of thermoplastic polymer having a thickness of at least 0.25 mm in which molten thermoplastic polymer is extruded between first and second die lips of an extrusion coating die and onto the face of said sheet substrate, said extrusion die being formed, in part, of a metal block having means to feed molten polymer therethrough to said die lips, the improvement comprising feeding a wood sheet substrate in face-to-face contact with said metal block over substantially the entire width of said sheet substrate, passing said sheet substrate from contact with the metal block into spaced apart relationship with the first die lip, said sheet substrate thereby forming the second die lip of the extrusion coating die, the first die lip extending substantially parallel to and in spaced apart relationship from the sheet substrate for a distance of at least 10 cm, said sheet substrate having a plurality of openings selected from the group consisting of orifices or slits in the surface thereof, extruding molten thermoplastic polymer into the space between the first die lip and the sheet substrate and thereby coating the sheet substrate with thermoplastic polymer.*



# PLANT PATENTS

## GRANTED NOVEMBER 3, 1981

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

**4,784**

### TABLE GRAPE

**Harold P. Olmo, Putah Creek Levee Rd., and Albert T. Koyama, 713 Hunt Way, both of Davis, Calif. 95616**

**Filed Jan. 28, 1980, Ser. No. 115,858**
**Int. Cl.[3] A01H** *5/00*
**U.S. Cl. Plt.—47** **1 Claim**

1. The new and distinct variety of table grape herein described and illustrated and identified by the characteristics enumerated above.

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**4,785**

### GERANIUM PLANT

**Walter H. Jessel, Jr., Fremont, and William E. Duffett, Salinas, both of Calif., assignors to Yoder Brothers, Inc., Barberton, Ohio**

**Filed Aug. 5, 1980, Ser. No. 175,426**
**Int. Cl.[3] A01H** *5/00*
**U.S. Cl. Plt.—68** **1 Claim**

1. A new and distinct geranium plant, a hybrid of the genus Pelargonium, L'Her., referred to by the cultivar name Fame, as described and illustrated, and characterized by the combination of characteristics of scarlet red flower color; medium plant height; short internode length; semi-double flower form; semi-spreading branching pattern; early spring-pot flowering response; prolific outdoor summer flowering traits; good foliage durability; good flower durability; and dark green foliage color with pronounced dark zonation.

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**4,786**

### CHRYSANTHEMUM PLANT

**Walter H. Jessel, Jr., Fremont, and William E. Duffett, Salinas, both of Calif., assignors to Yoder Brothers, Inc., Barberton, Ohio**

**Filed Aug. 5, 1980, Ser. No. 175,752**
**Int. Cl.[3] A01H** *5/00*
**U.S. Cl. Plt.—74** **1 Claim**

1. A new and distinct cultivar of *Chrysanthemum morifolium,* Ramat., plant known by the cultivar name Cheers and particularly characterized as to uniqueness, as herein described and illustrated, by the combined characteristics of flat capitulum form; daisy capitulum type; white ray floret color; diameter across face of capitulum ranging from 95 to 105 mm. at maturity; uniform seven week photoperiodic flowering response to short days; long peduncle length; medium plant height when grown as a single stem cut spray; and semi-upright branching pattern.

# PATENTS

## GRANTED NOV. 3, 1981

### ERRATA

| For CLASS | See PATENT NO. |
|---|---|
| 174–138 | 4,297,769 |
| 368–076 | 4,297,838 |
| 280–777 | 4,297,911 |
| 361–248 | 4,297,947 |
| 220–070 | 4,298,143 |
| 501–105 | 4,298,385 |
| 501–080 | 4,298,386 |
| 501–092 | 4,298,387 |
| 501–015 | 4,298,388 |
| 501–077 | 4,298,389 |
| 501–032 | 4,298,390 |
| 376–290 | 4,298,431 |
| 376–365 | 4,298,432 |
| 376–286 | 4,298,433 |
| 376–364 | 4,298,434 |
| 073–864 | 4,298,575 |
| 376–108 | 4,298,804 |
| 376–111 | 4,298,805 |

# PATENTS

GRANTED NOVEMBER 3, 1981

## GENERAL AND MECHANICAL

**4,297,746**

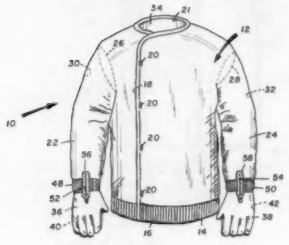
### TORSO GARMENT INCORPORATING REMOVABLE HAND COVERINGS

**Catherine Zarbos, 845 Brunswick Rd., Baltimore, Md. 21221**

**Filed Jun. 27, 1980, Ser. No. 163,590**

**Int. Cl.³ A41D *1/02***

**U.S. Cl. 2—108** **7 Claims**



**1**. A garment for covering the upper torso, arms, and hands of a wearer comprising:

a body portion dimensioned to cover the torso of the wearer, said body portion having a pair of arm apertures disposed through the sides thereof through which the arms of the wearer pass when said body portion is disposed on said torso;

a pair of arm portions dimensioned to cover said arms of said wearer, each of said arm portions being affixed on one end thereof to said body portion about one of said arm apertures to form a sleeve, the interior of said sleeves communicating with the interior of said body portion;

a pair of hand covering portions dimensioned to cover the hands of said wearer, one of said hand covering portions being affixed to the other ends of each of said arm portions, the interior of each of said hand covering portions communicating with the corresponding arm portion, said arm portions and said hand covering portions thereby forming a pair of integral arm-hand covering portions;

each of said integral arm-hand covering portions having disposed therein a slit dimensioned to pass the adjacent hand of the wearer therethrough, each of said slits being disposed in the associated said arm-hand covering portions in the portion thereof which resides proximate to the back of the adjacent wrist of the wearer when wearing said garment, said slit in each of said integral arm-hand covering portions being longitudinally disposed relative to the longitudinal axis of the associated said arm portion, an annular section of each of said arm-hand covering portions being reinforced, said longitudinally disposed slit in each arm-hand covering portion extending through said corresponding annular reinforced section, each of said slits being dimensioned to permit tucking of said adjacent hand covering portion into said adjacent arm portion proximate to the underside of the wrist of the wearer when the hand of the wearer is extended through said slit, said annular reinforced portions thereby serving as a cuff for said arm portion; and

a pair of selective closure means for closing and opening said slits as desired by the wearer.

**4,297,747**

### DEVICE TO ACTUATE HELMET VISORS, PARTICULARLY FOR MOTORCYCLISTS

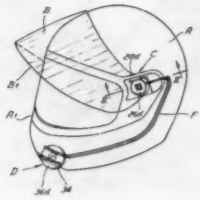
**Pier L. Nava, Verderio Superiore, Como, Italy**

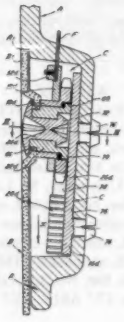
**Filed Feb. 29, 1980, Ser. No. 125,986**

**Claims priority, application Italy, Jul. 27, 1979, 24747 A/79**

**Int. Cl.³ A42B *3/02*; A61F *9/00***

**U.S. Cl. 2—424** **12 Claims**





**1**. A device for actuating a visor of a helmet, said helmet having a front aperture bounded by a ledge for housing the peripheral portion of said visor comprising:

first and second hinges connected to support said visor for angular rotation and linear motion into and out of communication with said ledge;

first and second guides located on opposite sides of said helmet;

first and second pinions connected to rotate said hinges and visor, said pinions being located within said guides;

first and second slide elements connected to each of said pinions for linearly displacing said pinions whereby said visor is linearly moved away from said helmet ledge;

first and second racks disposed within said guides for engaging said pinions when said visor has been displaced from said helmet ledge whereby said visors are angularly displaced by continued linear movement of said pinions; and

a control element for linearly displacing said slide elements within said guides whereby said visor is linearly displaced to and from said ledge and angularly rotated.

**11**. A device according to claims **1** or **9**, further comprising means for inhibiting rotation of said pinions when said pinions are free of said racks.

**4,297,748**
**MIDDLE EAR BALLOON**
**Peter J. Moloy, 29 Cypress Way, Rolling Hills Estates, Calif. 90274**
**Filed Jan. 2, 1980, Ser. No. 109,161**
**Int. Cl.³ A61F *1/00***
**U.S. Cl. 3—1** **12 Claims**

**1.** The method of reducing blockage of air wave induced motion of the round window membrane in the inner ear, and employing a pillow, that includes

(a) sizing the pillow for reception in the hypotympanum recess, and

(b) implanting the pillow in said recess in a location to yieldably block displacement of the tympanic membrane toward the round window membrane, thereby to prevent undesired interference with motion of the round window membrane by motion of the tympanic membrane.

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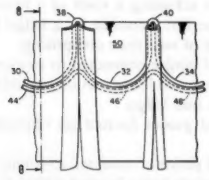
**4,297,749**
**HEART VALVE PROSTHESIS**
**Robert B. Davis, Framingham; John Skelton, Sharon, both of Mass.; Richard E. Clark, and Wilbur M. Swanson, both of St. Louis, Mo., assignors to Albany International Corp., Albany, N.Y. and Washington University, St. Louis, Mo.**
**Continuation-in-part of Ser. No. 790,442, Apr. 25, 1977, Pat. No. 4,192,020, which is a continuation-in-part of Ser. No. 771,359, Feb. 23, 1977, abandoned, which is a continuation-in-part of Ser. No. 575,438, May 7, 1975, abandoned. This application Feb. 27, 1980, Ser. No. 125,121**
**Int. Cl.³ A61F *1/22***
**U.S. Cl. 3—1.5** **6 Claims**



**1.** A frame system for a heart valve prosthesis comprising:

a first frame having at least three generally parallel legs each comprising a pair of rod portions connected at one end and diverging at the other end as lobes respectively connecting with rod portions of others of said legs, the lobes forming an aperture therebetween, said legs being adapted to receive the margin of a valve leaflet between the rod portions thereof, whereby said leaflet may be secured to two adjacent legs and the interconnecting lobe so as to have a free edge extending between said adjacent legs; and

a second frame adapted to nest with said first frame comprising a rod formed in a closed loop to be substantially congruent with each of said interconnecting lobes between the points of divergence at said other ends of each of said pairs of rod portions, whereby said leaflet may be secured to a lobe by passing it between said frames.

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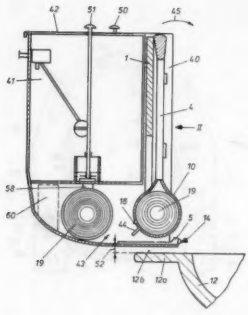
**4,297,750**
**TOILET AND COVER**
**Rainer M. Lutz, Reichberg 29, 7827 Löffingen, Fed. Rep. of Germany**
**Filed Aug. 28, 1979, Ser. No. 70,355**
**Int. Cl.³ A47K *13/18, 13/16***
**U.S. Cl. 4—247** **16 Claims**



**1.** In combination, a toilet bowl, a toilet seat, means hingedly supporting said toilet seat for rotation around a transverse hinge axis adjacent the rear portion of said toilet bowl and allowing the seat to supportingly engage on the rim of said toilet bowl, dispensing housing means adjacent said toilet bowl rear portion mounted coaxially with said hinge axis, and rigidly connected to said seat, and a supply of frangible web material disposed in said dispensing housing means and being of a width sufficient to overlie the toilet seat, said housing means having a dispensing opening in its rear top side arranged to permit withdrawal of the web material to cover the seat, said web material including separable substantially identical main seat cover sheets sucessively movable to a position covering the seat, the seat cover sheets being formed to define on each sheet respective front and rear freely descending flaps of a length sufficient to become at least partially immersed in the water in the toilet bowl and shaped to define a composite opening substantially conforming with the interior of the toilet bowl when said flaps drop to depending positions, said flaps being formed so that the respective flaps assume depending immersed transverse positions adjacent to and shielding the front and rear inside wall surfaces of the toilet bowl.

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**4,297,751**
**SEWER SYSTEM**
**Henry Olin, Espoo; Nils Tallberg, Helsinki, and Martti Varis, Espoo, all of Finland, assignors to Oy Wartsila AB, Helsinki, Finland**
**Filed Aug. 17, 1979, Ser. No. 67,299**
**Claims priority, application Finland, Aug. 25, 1978, 782603**
**Int. Cl.³ E03D *11/00***
**U.S. Cl. 4—431** **15 Claims**

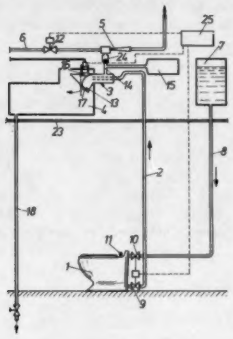
**1.** A sewer system including

means for generating a partial vacuum for transporting sewage through a sewer pipe to a collecting chamber for an installation comprising a small number of sewage producing units, preferably only one of said sewage producing units being usable at a time,

said sewer pipe between each said sewage producing unit and said collecting chamber having a small total volume,

control means for starting and stopping said partial vacuum generating means, and

means for activating said control means for generating a vacuum in said sewer pipe principally only for the time required for transporting each separate sewage discharge



from a selected one of said small number of sewage producing units to said collecting chamber, and

said sewer pipe being otherwise under a higher pressure.

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**4,297,752**

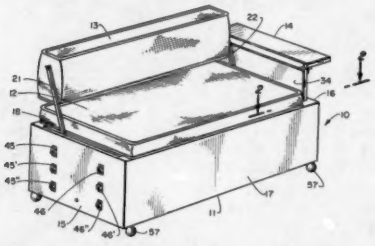
**CONVERTIBLE FURNITURE**

**Calvin Dick, 2725 Cooper Ct., Apt. 1, Napa, Calif. 94558, and Patrick C. Malone, Richardson, Tex., assignors to Calvin Dick, Napa, Calif.**

**Filed Jul. 16, 1979, Ser. No. 58,070**

**Int. Cl.³ A47C** *17/12, 17/16, 17/04*

**U.S. Cl. 5—52** **8 Claims**



1. An article of furniture convertible between a couch or loveseat and a daybed or the like comprising:

a main housing comprising spaced front and rear walls interconnected by spaced side walls;

a horizontal seat closing off the upper surface of said main housing;

a back rest mounted on said main housing having a portion vertical with respect to said seat, and back rest connecting means coupling said vertical portion to said main housing for orienting said vertical portion from either a point adjacent the front of said main housing or the rear thereof;

an arm rest coupled to said main housing having a planar surface parallel to that of said seat in a first position;

arm rest connecting means connecting said arm rest to said main housing for alternately placing said arm rest in a first position wherein said planar surface thereof is spaced vertically upwardly from the planar surface of said seat to a second position wherein the planar surface of said arm rest is angularly disposed with respect to the planar surface of said seat, wherein said arm rest connecting means includes an elongated slot in at least one of said sidewalls, and an arm rest supporting means hingedly connected to said arm rest, extending down into said slot.

**4,297,753**

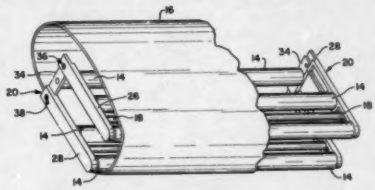
**PATIENT TRANSFER DEVICE**

**Robert J. Langren, Alameda, Calif., assignor to Warner-Lambert Company, Morris Plains, N.J.**

**Filed Sep. 7, 1979, Ser. No. 73,416**

**Int. Cl.³ A61G** *7/08, 12/00*

**U.S. Cl. 5—81 C** **8 Claims**



1. In a patient transfer device having a frame with trussed opposite end plates carrying a plurality of parallel rollers which support an endless belt very tightly, the improvement comprising:

means permitting selective folding of said end plates from a straight configuration, defining a tight belt condition, into a U-shaped configuration, defining a loose belt condition and

cam means for releasably locking said plates in said straight configuration.

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**4,297,754**

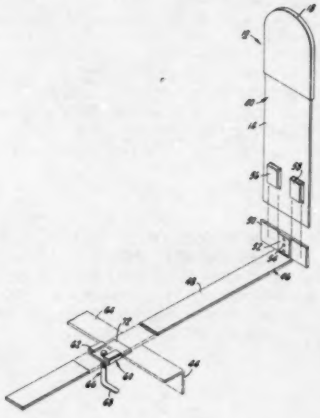
**BOX SPRING AND MATTRESS SUPPORT DEVICE**

**Julio A. Zuniga, 2310 Powell St., San Francisco, Calif. 94133**

**Filed Dec. 10, 1979, Ser. No. 102,012**

**Int. Cl.³ A47C** *21/00*

**U.S. Cl. 5—411** **8 Claims**



1. A box spring and mattress supporting device useable with a bed frame that includes a supporting member for said box spring and mattress, comprising:

a. an upright member adapted for extending upwardly adjacent the box spring and mattress;

b. clip means for holding said upright member to the supporting member of the bed frame, said clip means including an element extending from said upright member and forming a channel in conjunction with a portion of said upright member; said channel being capable of at least partially surrounding the supporting member, and having a portion of said element extending from said upright member passing over the top portion of the supporting

member, said supporting device being adapted to prevent the slippage of said box spring and mattress relative to said frame.

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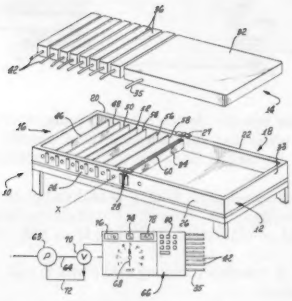
**4,297,755**
**NON-PLANAR WATERBED**
**Carlos A. Mollura, 2824 Del Oro Pl., Fullerton, Calif. 92632**
**Filed Feb. 15, 1980, Ser. No. 121,906**
**Int. Cl.³ A47C *27/08***
**U.S. Cl. 5—455** **3 Claims**



**1.** In a waterbed structure:
(a) a waterbed frame including a plurality of sections, at least one of which is inclined, said one frame section having side walls;
(b) a series of supports extending across the inclined frame section and defining a series of individual pockets for waterbed bag elements;
(c) a series of individual waterbed bag elements in said pockets and supported by said supports;
(d) waterbed bag means for the remaining section or sections of said frame;
(e) said waterbed bag elements being contiguous with each other to provide an integral substantially flat support surface adjoining said waterbed bag means;
(f) each of said supports being structurally connected to said side walls of said frame whereby said supports sustain components of the weight of said bag elements in said pockets.

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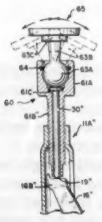
**4,297,756**
**LOCKING WRENCH TOOL WITH AUXILIARY MECHANICAL OUTPUT**
**Bruce J. Lance, 1460 Chase Dr., Corona, Calif. 91720**
**Continuation-in-part of Ser. No. 83,000, Oct. 9, 1979, abandoned. This application Mar. 7, 1980, Ser. No. 128,307**
**Int. Cl.³ B25B *7/22, 7/12***
**U.S. Cl. 7—127** **7 Claims**



**1.** In a locking wrench tool having coacting jaws, fixed and movable handle structure and resiliently biased toggle mechanism operative to maintain the coacting jaws of said tool locked clamped, the improvement in combination therewith of auxiliary means for generating a mechanical output, said auxiliary mechanical output generating means being actuated to generate a mechanical output by the movement and positioning of said toggle mechanism occurring in connection with the clamping action of said tool and comprising:
ball means for supporting an object to be held, said ball means including a substantially round ball with an extension member formed to extend therefrom, said extension member being adapted to engage and support an object to be held;
socket means for receiving and rotatably holding said ball therein; and
means actuated by the movement and positioning of said toggle mechanism occurring in connection with the clamping action of said tool for clamping said ball against rotation in a fixed position in said socket means.

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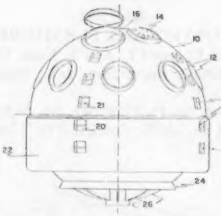
**4,297,757**
**MARINE RESCUE CAPSULE**
**Oscar M. Palemón Camú, 40-C Estocolmo St., Mexico City 6, Mexico**
**Filed Aug. 3, 1978, Ser. No. 930,607**
**Int. Cl.³ B63C *9/02***
**U.S. Cl. 9—4 R** **12 Claims**



**12.** A marine livesaving capsule of substantially spherical configuration carrying on the upper third of its body portholes which are watertight but allow the penetration of solar light; having doors or hatches for access disposed either on the top or the sides of its body; a series of radial fins on the bottom limited by a peripheral fin for stabilizing the capsule; an air chamber surrounding it the upper edge of which coincides substantially with the flotation line of the capsule; a telescoping stabilizing counterweight having its axis coinciding with the vertical axis of the capsule; a system of ventilation provided in at least two upper hatches of the capsule; and a ring-shaped seat under which several compartments are set off for storage of dehydrated provisions, water, navigational equipment, toilet, etc.,
the said system of ventilation being fixedly mounted on one of the upper hatches of the capsule.

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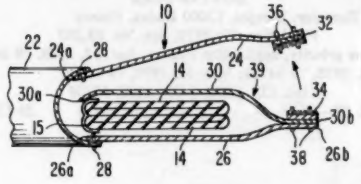
**4,297,758**
**LIFE PRESERVER OF THE ENCAPSULATED TYPE**
**Harold J. Moran, Trenton, N.J., assignor to Switlik Parachute Company, Inc., Trenton, N.J.**
**Filed Jan. 28, 1980, Ser. No. 115,982**
**Int. Cl.³ B63C *9/16***
**U.S. Cl. 9—340** **12 Claims**

**1.** In an inflatable life preserver of the encapsulated type including an inflatable cell means, said life preserver further including a cover adapted to provide a primary protective enclosure for the cell means in an inflated condition of said means, said cover having flexible, normally connected panels in protective embracing relation to the inflated cell means and also having separable fastener elements on the panels adapted to disengage for separation of the panels in response to inflation of the cell means, the improvement that comprises a pro-

tective flap inside the cover adapted to cooperate with at least one of the panels to provide an auxiliary enclosure for the cell means in the event of accidental separation of the panels with the cell means in an inflated condition, the panels having inner edges connected together to define said open center and have




outer edges along which the fastened elements are disposed, said flap having an outer edge secured to the outer edge of said one panel, the flap and said one panel being substantially coextensive in width with the flap having a free inner edge overlying and in close proximity to the inner edge of said one panel.

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**4,297,759**

**FLOATING BRIDGE**

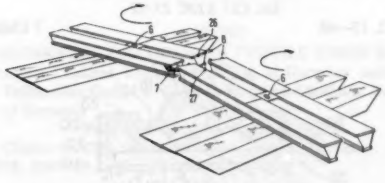
**Friedhelm Soffge, Kornwestheim, and Hans Weigele, Stuttgart, both of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche AG, Stuttgart, Fed. Rep. of Germany**

**Filed Nov. 26, 1979, Ser. No. 97,122**

**Claims priority, application Fed. Rep. of Germany, Nov. 24, 1978, 2850848**

**Int. Cl.³ E01D *15/14***

**U.S. Cl. 14—2.6** **6 Claims**



**1**. A transportable floating bridge comprising a bridge unit, a buoyant pontoon means supporting said bridge unit, displacement means carried by said pontoon means for lifting and pivoting said bridge unit, rotatable fixing means carried by the bridge unit for swingably linking said bridge unit to a like pontoon means supported bridge unit in a manner enabling relative rotation therebetween in a horizontal plane, and coupling means carried by the bridge unit for rigidly coupling said bridge unit to said like pontoon means supported bridge unit.

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**4,297,760**

**DEBRIS PICKER AND BAGGER**

**Humbert Olivari, 3835 Janbrook Rd., Pandallstown, Md. 21133**

**Division of Ser. No. 937,302, Aug. 28, 1978, Pat. No. 4,217,672. This application Feb. 4, 1980, Ser. No. 118,232**

**Int. Cl.³ E01H *1/04*; A01G *1/12***

**U.S. Cl. 15—79 R** **12 Claims**

**1**. A device for collecting debris from the ground and depositing said debris in a disposable container, comprising:

a pair of support wheels spaced apart, said wheels providing power when in motion to operate debris collecting and depositing mechanism;

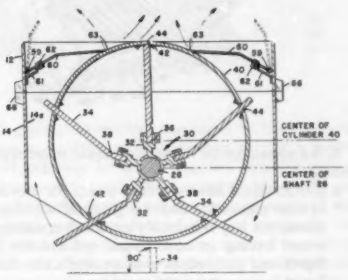
a gear system connected to said support wheels to receive power from said support wheels and transmit said power to said debris collecting and depositing mechanism;

a cover system for said gear system;

a plurality of spaced debris raking means on a rotatable shaft, said rotatable shaft being connected to said gear system and receiving power therefrom for rotating said debris raking means;

a rotatable cylindrical drum means surrounding said debris raking means, with spaced rectangular shaped slots therein to permit ends of said debris raking means to extend therethrough, said cylindrical drum being excentrically connected to said gear system;

a housing means surrounding said cylindrical drum means connected to and supported by the cover system for said




gear system, said housing means forming a chute means to conduct collected debris into a disposable container;

a disposable container means for receiving and holding said collected debris removably connected to said housing means and communicating therewith;

a handle means for manually pushing said device for collecting debris, said handle means being attached to said housing means; and

an adjustable support means for the rear of said device for collecting debris, said adjustable support means connected to said housing means.

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**4,297,761**

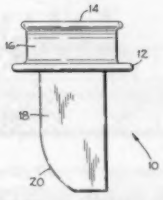
**GARBAGE DISPOSAL UTENSIL**

**Evelyn J. Loos, Saratoga, Calif., assignor to Stanley M. Weir, Santa Clara, Calif.**

**Filed Jun. 26, 1980, Ser. No. 163,392**

**Int. Cl.³ A47L *25/00***

**U.S. Cl. 15—105** **3 Claims**




**1**. A multi-purpose disposal utensil for use with a garbage disposer comprising:

a plug adapted to fit in a drainhole opening above a garbage disposer;

a handgrip secured to the top side of the plug; and

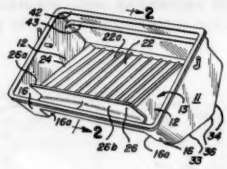
an elongated sweeping-agitating member secured to the bottom side of the plug for sweeping garbage into a garbage disposer drain hole and for urging garbage into the garbage disposer, said sweeping-agitating member adapted to reach substantially all the area in a garbage disposer drainhole above a garbage disposer when said plug is nearly seated in the drainhole opening and manually rotated by the handgrip.

**4,297,762**

## PAINT TRAY AND RESERVOIR

**Donald T. Crysdale, Milwaukee, Wis., assignor to E Z Paintr Corporation, Milwaukee, Wis.**

**Filed Sep. 27, 1979, Ser. No. 79,311**
**Int. Cl.³ B44D *3/12***
**U.S. Cl. 15—257.06** **15 Claims**



**1.** An apparatus for dispensing liquid to an applicator, comprising:

a plastic vessel having a first means for storing liquid and second means for dispensing liquid wherein said second means is a tray removably mounted in said apparatus, said vessel having an open upper end suitable for intake of liquid and for insertion of an applicator for picking up liquid from said second means;

a base supporting said vessel securely in a first operative position wherein said second means retains said liquid;

an auxiliary base securely supporting said vessel in a second operative position wherein said liquid is dispensed from said first means to said second means; and

means including a fulcrum adjacent said base and said auxiliary base for selectively rocking said vessel into either of said operative positions.

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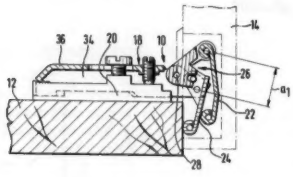
**4,297,763**

## FURNITURE HINGE

**Reinhard Lautenschläger, Reinheim, Fed. Rep. of Germany, assignor to Karl Lautenschlager KG, Reinheim, Fed. Rep. of Germany**

**Filed Nov. 28, 1979, Ser. No. 98,044**
**Claims priority, application Fed. Rep. of Germany, Feb. 12, 1978, 2852229**
**Int. Cl.³ E05D *3/06, 3/10, 15/52, 15/54***
**U.S. Cl. 16—164** **6 Claims**



**1.** A hinge for pivotably linking a door leaf or lid to a carcass of a furniture piece, said hinge having a door-related part attachable to the door leaf or lid, and a supporting-wall-related part attachable to said carcass, first and second hinge links both pivotingly attached to the door-related part and pivotingly joining said parts together in the manner of a four-joint hinge so that the same is movable from a hinge-open to a hinge-closed position and vice versa, said first link being farther from the supporting wall-related part than said second link and being linked to a pivot piece so as to be pivotable about a first pivot axis, said pivot piece being pivotingly linked to the supporting wall-related part so as to be pivotable about a second pivot axis, said second hinge link being pivotably linked to said supporting wall-related part at a third pivot axis and said pivot piece being coupled operatively to said second hinge link such that said first pivot axis of said first hinge link has in said hinge-open position a minimum distance and in said hinge-closed position a maximum distance from said third pivot axis.

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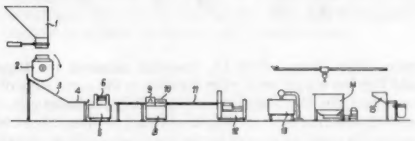
**4,297,764**

## METHOD AND INSTALLATION FOR PROCESSING BOVINE FEET

**Claude Tournier, Lioujas, 12000 Rodez, France**

**Filed Nov. 19, 1979, Ser. No. 95,247**
**Claims priority, application France, Apr. 12, 1978, 78 34720; Apr. 12, 1978, 78 34721; May 30, 1979, 79 13786**
**Int. Cl.³ A22B *5/08;* A22C *17/04***
**U.S. Cl. 17—46** **25 Claims**



**1.** In a method of processing bovine feet comprising the steps of washing, dehoofing, scalding, depilating and boning the feet, the improvement wherein said boning step is carried out before said scalding step to obtain a flesh portion separate from a bone portion, said scalding and depilating steps then being carried out on said flesh portion.

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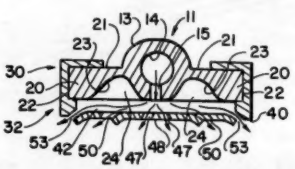
**4,297,765**

## FISH SCALER WITH WATER HANDLE

**Wilbur E. Altman, and William C. McQuay, both of Charlotte, N.C., assignors to Wilbur E. Altman, Charlotte, N.C.**

**Filed Mar. 17, 1980, Ser. No. 131,233**
**Int. Cl.³ A22C *25/02***
**U.S. Cl. 17—66** **7 Claims**



**1.** A fish scaler comprising a bottom wall having a longitudinal axis and plurality of transversely spaced openings through the bottom wall on both sides of the longitudinal axis and parallel thereto, an imperforate baffle extending along the longitudinal axis, the marginal edges of the openings including serrations on both sides of the longitudinal axis, imperforate sidewalls extending from the bottom wall, and means directing water against the baffle whereby the water is diverted laterally about the serrations and outwardly through the openings.

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**4,297,766**

## METHOD AND APPARATUS FOR FORMING FIBER MIXTURES

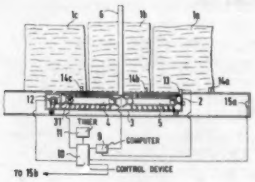
**Hermann Trützschler, Monchen-Gladbach, Fed. Rep. of Germany, assignor to Trützschler GmbH & Co. KG, Mönchen-Gladbach, Fed. Rep. of Germany**

**Filed Jul. 20, 1979, Ser. No. 59,205**
**Claims priority, application Fed. Rep. of Germany, Jul. 21, 1978, 2832085**
**Int. Cl.³ D01G *7/08, 13/00***
**U.S. Cl. 19—80 R** **17 Claims**

**1.** In a method of forming fiber mixtures from different kinds of fiber, including the step of removing the fiber in a plurality of passes from a plurality of stored fiber lots containing the

different kinds of fiber, wherein during each pass fiber is removed from consecutive stored fiber lots in partial quantities that are small relative to the entire fiber quantities in the stored fiber lots; the improvement comprising the following steps:

(a) separately determining, prior to fiber removal in the first pass, the entire fiber quantity in each stored fiber lot;




(b) separately determining for each stored fiber lot, prior to fiber removal in the first pass, a partial quantity to be removed from each stored fiber lot during the first pass, each said partial quantity representing a proportion of the entire fiber quantity of the respective stored fiber lot; and

(c) removing, at least during the first pass, the determined partial quantity from the respective stored fiber lot.

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**4,297,767**

**APPARATUS FOR OPENING TEXTILE FIBER BALES**

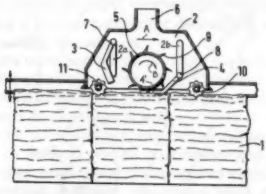
**Ferdinand Leifeld, Kempen, Fed. Rep. of Germany, assignor to Trützschler GmbH & Co. KG, Monchen-Gladbach, Fed. Rep. of Germany**

**Filed Oct. 26, 1979, Ser. No. 88,573**

**Claims priority, application Fed. Rep. of Germany, Nov. 2, 1978, 2847461**

**Int. Cl.³ D01C** *7/04, 7/06*

**U.S. Cl. 19—80 R** **22 Claims**



**1.** In an apparatus for opening textile fiber bales, including a bale opening arrangement adapted to travel parallel to the length of the apparatus along serially arranged fiber bales; the bale opening arrangement including a bale opening member having a plurality of opening elements for penetrating, in an opening zone, into the fiber material of the bales at an upper face thereof and a grate means formed of parallel-spaced grate bars for engaging, in an operative position of the grate means, the upper face of the bales; the opening elements of the opening member projecting in between adjoining grate bars in the opening zone; the improvement wherein said grate bars, when viewed in said operative position, terminate in a free end in said opening zone.

**4,297,768**

**CARDING PLATE**

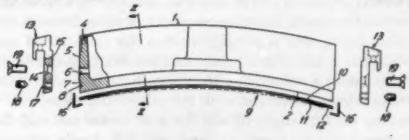
**Walter Löffler, Neubulach, Fed. Rep. of Germany, assignor to Hollingsworth GmbH, Neubulach, Fed. Rep. of Germany**

**Filed Oct. 17, 1979, Ser. No. 85,810**

**Claims priority, application Fed. Rep. of Germany, Oct. 23, 1978, 2846110**

**Int. Cl.³ D01G** *15/24, 15/84*

**U.S. Cl. 19—113** **13 Claims**



**1.** A carding plate comprising: a support with a base plate and a concave supporting surface forming part of a hollow cylinder; sawtooth wire sections supported adjacent one another on said supporting surface as the card clothing; a substantially thin flexible holding plate attached to said sawtooth wire sections; a carding element formed by said sawtooth wire sections and said holding plate and being secured to said supporting surface of said base plate; said holding plate being held in intimate contact with said base plate by exerting pressure on opposite edges of said flexible holding plate, said supporting surface having a cylindrical curvature causing pressure exerted in a circumferential direction of said holding plate to generate a reactive force in a radial direction between said supporting surface and said holding plate.

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**4,297,769**

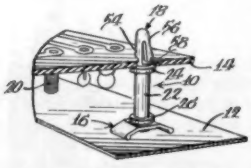
**LOCKING STAND OFF**

**Ronald A. Coules, Barrington, Ill., assignor to Unarco Industries, Inc., Chicago, Ill.**

**Filed Dec. 26, 1979, Ser. No. 107,498**

**Int. Cl.³ A44R** *21/00*; **F16B** *19/00*

**U.S. Cl. 174—138 D** **6 Claims**



**1.** A fastener for maintaining a pair of apertured panels in spaced-apart relation, comprising:

an upstanding elongated post having a top end and a bottom end,

means extending upwardly from the top end of said post that is receivable in an aperture in one of said panels for securing said fastener to said one panel,

a stem having a generally vertical axis and extending downwardly from said bottom end of said post and adapted to be projected through an aperture in the other of said panels, said stem comprising a pair of diametrically opposed generally flat wall means extending radially outwardly from said axis and having a cross-sectional dimension, in a plane parallel to a plane through said other panel, that is no greater than the diameter of said aperture in said other panel, said flat wall means each terminating in a free edge parallel with the free edge of the other wall means and with the axis of said stem,

means projecting outwardly from said stem and adapted to engage the bottom surface of said other panel to prevent removal of said fastener from said other panel,

resiliently yieldable arm means adapted to bear against the upper surface of said other panel, said arm means being integral with at least one of said post and said stem, and merging therewith at a location spaced above said projecting means by a predetermined distance greater than the thickness of said other panel, and

a pair of flat diametrically opposed generally planar flange means extending downwardly from said arm means and radially outwardly from said axis, and having a cross-sectional dimension, in a plane parallel to a plane through said other panel, that is no greater than the diameter of said aperture in said other panel, said flat flange means each terminating in a free edge parallel with the free edge of the other flange means and with the axis of said stem,

whereby the free edges of said flat wall means and said flat flange means are adapted to be positioned closely adjacent to the wall of said other panel that defines said aperture and are together adapted to engage the wall of said other panel at four spaced apart locations that are about equally spaced from one another and are positioned radially outwardly from said axis, thereby to minimize rocking movement of said fastener when positioned in said aperture in said other panel.

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**4,297,770**

## SLIDE FASTENER AND METHOD OF MAKING SAME

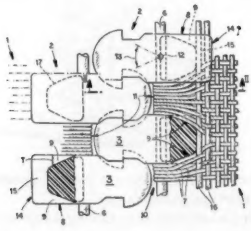
**Helmut Wulz, Birmensdorf, Fed. Rep. of Germany, assignor to Optilon W. Erich Heilmann GmbH, Cham, Switzerland**

**Filed Jul. 10, 1979, Ser. No. 56,394**

**Claims priority, application Fed. Rep. of Germany, Jul. 12, 1978, 2830520; Jul. 12, 1978, 2830521; Jul. 12, 1978, 2830530**

**Int. Cl.[3] A44B *19/34***

**U.S. Cl. 24—205.16 R** **17 Claims**



1. A slide fastener comprising a pair of woven support tapes having juxtaposed edges, respective rows of coupling elements affixed to said edges and spaced apart therealong, the coupling elements of one row being interdigitatable with the coupling elements of the other row, each of said coupling elements having a head engageable between two coupling elements of the other row and a pair of arms reaching back toward the respective tape and joined together in a weld zone at the respective tape, and a respective continuous support extending along each row and engaged by the coupling elements thereof, each of said tapes having weft yarns extending over the respective support between the coupling elements, each of said coupling elements being formed with lateral grooves with a depth increasing toward the respective tape and receiving said weft yarn.

**4,297,771**

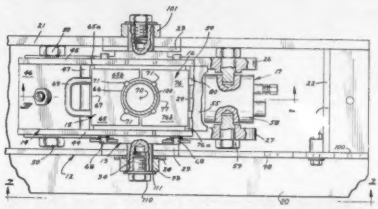
## PIVOTING FOOT CLAMP AND MOUNTING FRAME

**Ronald B. Anderson, Plymouth; Clifford Caneer, Jr., Anoka, and Terrance C. Maki, Coon Rapids, all of Minn., assignors to Longyear Company, Minneapolis, Minn.**

**Filed Jun. 14, 1979, Ser. No. 48,488**

**Int. Cl.[3] A44B *21/00*; E21B *19/07***

**U.S. Cl. 24—263 DA** **12 Claims**



1. Apparatus for clampingly holding a rod having a central axis of elongation, comprising a base, a first and a second jaw means for cooperatively clampingly engaging a rod, a jaw holder mounting the jaw means for movement between a rod clamping position adjacent the rod axis and a rod release position more remotely spaced from the rod axis and one another and also remotely spaced along said axis from the rod clamping position, power operated means mounted on the jaw holder and connected to the jaw means for moving the jaw means between the rod release position and the rod clamping position, and oppositely disposed trunnions joined to the jaw holder for mounting the jaw holder on the base for pivotal movement about a pivot axis that passes through the central axis and is perpendicular thereto.

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**4,297,772**

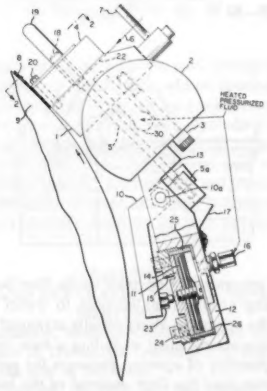
## AUTOMATIC COVER FOR YARN BULKING JET APPARATUS

**John S. Seney, Seaford, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed May 21, 1980, Ser. No. 151,898**

**Int. Cl.[3] D02G *1/16***

**U.S. Cl. 28—257** **4 Claims**




1. In a yarn-treating jet apparatus, including a jet body, a cover for said body, and means for positioning said body and said cover with respect to one another alternatively in a contiguous operative closed position and in a spaced-apart inoperative open position, said body and cover when in closed position together forming a longitudinal passage between them through which yarn can be passed for treatment, at least one

conduit in communication with said yarn passage for directing fluid against the yarn while in said passage, and a pressurized fluid supply connected to said conduit, the improvement in said means for positioning said body and cover comprising a longitudinally movable actuating rod having a head end fastened to said cover, an opening extending entirely through said body from front to back at a location remote from said conduit and said yarn passage, said rod projecting substantially perpendicularly from the body-contacting side of said cover in alignment with and freely passing through said opening in said body, said rod having another end protruding beyond said body from said opening, said protruding end being operatively connected to spring powered first moving means for continuously exerting a longitudinal force on said rod for moving said cover into said open position in the absence of any counterforce, said protruding end also being operatively connected to a second moving means for exerting a greater longitudinal force on said rod for moving and holding said cover in said closed position by overcoming said first moving means and means for pneumatically powering said second moving means with fluid from said pressurized fluid supply.

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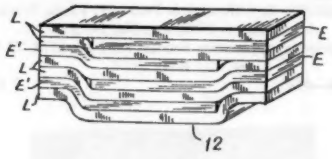
**4,297,773**

## METHOD OF MANUFACTURING A MONOLITHIC CERAMIC CAPACITOR

**John L. Galvagni, Solana Beach, Calif., assignor to AVX Corporation, Great Neck, N.Y.**

**Division of Ser. No. 961,247, Nov. 16, 1978. This application Mar. 20, 1980, Ser. No. 132,083**
**Int. Cl.³ H01G 4/30**
**U.S. Cl. 29—25.42** **3 Claims**




1. A method of manufacturing a monolithic ceramic capacitor device which includes a central area having internal partially overlapping electrodes of opposite polarity contained in a ceramic body forming a dielectric separator for said electrodes, said electrodes including outer end portions disposed at opposite ends of said body in contact with termination portions, said capacitor including a margin portion between said central area and each of said termination portions, said capacitor including a bottom surface for positioning adjacent a substrate, comprising the steps of:

aligning the outer end portions of first ones of said electrodes to define a first coextensive end at one end of the ceramic body, each of said first electrodes terminating short of the other end of the ceramic body;

aligning the outer end portions of second ones of said electrodes to define a second coextensive end at the opposte end of the ceramic body, said second electrodes interposing between said first electrodes, each of said second electrodes terminating short of the first coextensive end at the one end of the ceramic body;

interposing layers of ceramic between each of said first and second electrodes, thereby defining a series of aligned spaces inward of each of the opposed coextensive ends in the respective margin portions, the arrangement of said electrodes and ceramic layers forming a capacitor subassembly;

applying to said sub-assembly compressive forces exerted in a direction normal to the orientation of said electrodes to deform selective ones of said electrodes and ceramic layers into said spaces and to form indentations in said bottom surface, said indentations being in registry with the margin portions and extending to said ends, whereby a portion of said bottom surface between said indentations is at a level below the level of said indentations; and

completing the cure of said ceramic body, and applying conductive coating at the opposed ends to form said termination portions.

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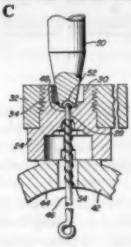
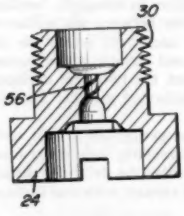
**4,297,774**

## METHOD FOR MODIFYING A FLUID FUEL METERING JET ORIFICE

**Alfred A. Medlock, P.O. Box 627, Ocean Springs, Miss. 39564**

**Filed Sep. 26, 1979, Ser. No. 79,309**
**Int. Cl.³ B23P 15/16, 6/00**
**U.S. Cl. 29—157 C** **2 Claims**






1. A method of modifying a liquid fuel carburetor metering jet orifice for fuel economy purposes and wherein the jet is constructed of a soft malleable metal such as brass and the orifice therethrough is longitudinally straight and includes inlet and outlet end portions, said method comprising:

(a) ascertaining at least the approximate diameter of said orifice;

(b) providing a single rod having a nonthreaded gauge pin portion and a low pitch screw threaded portion;

(c) placing said cylindrical gauge pin portion of a preselected size smaller in diameter than said orifice through the latter;

(d) applying a controlled sharp impact force to said jet throughout a circular zone generally concentric with said orifice on the surface of said jet through which the outlet end portion of said orifice opens and in a direction substantially paralleling the center line of said orifice, whereby to collapse those portions of said jet defining said outlet end portion of said orifice tightly about the adjacent portions of said gauge pin portion; and

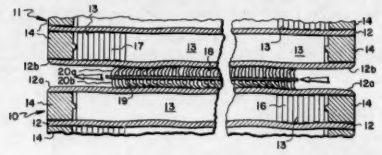
(d) threading a low pitch screw threaded pin portion through said collapsed orifice end portion from the inlet end of said orifice, wherein the minor and major diameters of the threads on the last mentioned pin portion are less and greater than, respectively, the diameter of the collapsed orifice end portion.

**4,297,775**

## METHOD FOR JOINING TWO PLATE TYPE HEAT EXCHANGER CORE SECTIONS WITH AN INTERMODULAR LAYER FOR IMPROVED HEAT TRANSFER

**Alan G. Butt, La Crosse, and Abe G. Whitehead, Onalaska, both of Wis., assignors to The Trane Company, La Cross, Wis.**

**Filed May 8, 1980, Ser. No. 147,776**
**Int. Cl.³ B23P *15/26***
**U.S. Cl. 29—157.3 R** **14 Claims**



**1.** A method for joining together, in intimate heat transfer relationship, two plate type heat exchanger core sections previously brazed individually in the aggregate, wherein the surfaces to be joined are matched in size, comprising the steps of

a. positioning a plurality of deformable metallic members between and substantially covering said surfaces to be joined, at least one of said surfaces being non-planar as a result of said brazing in the aggregate;

b. compressig the deformable metallic members between said surfaces to be joined;

c. subjecting the deformable metallic members to a shear force causing them to deform by bending, thereby reducing the separation between said surfaces and substantially increasing the area over which the deformed metallic members and said surfaces are in contact, whereby heat transfer between the two heat exchanger core sections through the deformed metallic members is greatly improved; and

d. connecting the perimeters of said surfaces of the heat exchanger core sections together in a manner which generally circumscribes the deformed metallic members, and maintains their contact with said surfaces.

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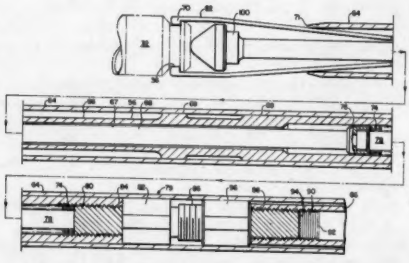
**4,297,776**

## LEAF SPRING PULLER FOR NUCLEAR FUEL RODS

**James L. Fogg, Columbia, S.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Apr. 9, 1979, Ser. No. 28,140**
**Int. Cl.³ B23P *19/04***
**U.S. Cl. 29—252** **6 Claims**



**1.** Apparatus for pulling a fuel rod from a storage container into grids of a nuclear reactor fuel assembly comprising:

a movable rod puller connected to means for longitudinally moving said puller toward the end of a stored fuel rod an end plug sealed in one end of said fuel rod and the axis of said rod being coextensive with the axis of said rod puller;

said rod puller comprising a hollow rod having integrally formed flexible spring members on one end thereof, said spring members being circumferentially spaced from one another;

projections on the end of said spring members, said projections having a configuration complementary to a groove formed in the end of said fuel rod end plug;

means on said rod puller constructed and arranged to coact with said flexible spring members to cause said projections to engage the groove on said end plug;

said rod puller having an outer diameter no greater than the outer diameter of the fuel rod when said projections are latched in the groove of said end plug to thereby permit pulling said fuel rod into a fuel assembly grid; and

axially adjustable means on said rod puller arranged to adjust the position of said projections relative to said groove to ensure latching of the spring members in the end plug groove;

whereby as said projections grasp said end plug, activation of said means connected to the rod puller causes it to pull the fuel rod out of said storage container and into said fuel assembly grids.

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**4,297,777**

## METHOD FOR THE PRODUCTION OF A COMPOSITE HOLLOW BODY

**Jean-Claude Kucza, St. Egreve; Albert Mastrot, St. Martin le Vinoux; Rene Perrot, Issoire, and Jean-Mary Wattier, Montreuil Juigne, all of France, assignors to Cegedur Societe de Transformation de l'Aluminium Pechiney, Paris, France**

**Filed May 6, 1980, Ser. No. 147,228**
**Claims priority, application France, May 16, 1979, 79 13289**
**Int. Cl.³ B22F *3/24***
**U.S. Cl. 29—420** **7 Claims**

**1.** A method for the production of a composite hollow body, comprising the steps of:

forming a hollow cylinder by extruding a mixture of metallic particles of a hypereutectic silicon alloy and an addition product;

forming a hollow billet by casting an aluminum alloy, the billet having a bore of a size adequate to receive the hollow cylinder thereinto;

inserting the hollow cylinder into the hollow billet; and

co-extruding the cylinder and billet together to form the composite hollow body.

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**4,297,778**

## METHOD AND APPARATUS FOR REMOVING LINERS FROM METAL CLOSURES

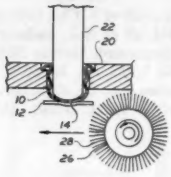
**Earl E. Rumberger, Pittsburgh, Pa., and Frank M. Kelly, Richmond, Ind., assignors to Aluminum Company of America, Pittsburgh, Pa.**

**Filed Apr. 28, 1980, Ser. No. 144,342**
**Int. Cl.³ B23P *19/04*; B21D *22/20***
**U.S. Cl. 29—426.4** **16 Claims**

**12.** Apparatus for separating a liner from a metal closure having a cylindrical skirt and a top end wall having an exterior

surface and an interior surface against which a liner is disposed, comprising:

a die having a circular opening therein;




a punch, coaxially aligned with the die opening, disposed above said die and the closure supported and retained thereon; and

a separating means disposed below said die and adjacent to the opening for separating the liner from the closure.

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**4,297,779**

## METHOD OF JOINING STRUCTURAL ELEMENTS

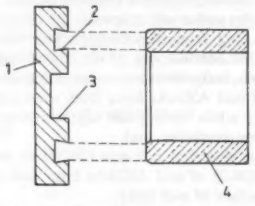
**Keith Melton, Busslingen; Olivier Mercier, Ennetbaden, and Peter Taiana, Neuenhof, all of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland**

**Filed Aug. 10, 1979, Ser. No. 65,568**

**Claims priority, application Switzerland, Aug. 10, 1978, 8507/78; Aug. 10, 1978, 8509/78**

**Int. Cl.³ B23P *11/02***

**U.S. Cl. 29—446** **16 Claims**




1. A process for the manufacture of a solid and tight join between components using first and second joining elements which comprises:

forming at least one annular dove-tail groove in said first joining element, said first joining element comprising a heat releasable, metallic, shape memory effect alloy;

pressing said second joining element into said at least one annular groove of said first joining element; and

shrinking by heating said first joining element so as to form said solid and tight join due to shape memory effect of said at least one groove of said metallic, shape memory effect alloy.

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**4,297,780**

## METHOD FOR CONNECTING SEWER PIPES TO MANHOLES OR OTHER PIPES

**Lowell D. Temple, 5235 Sherrill Dr., Fort Wayne, Ind. 46806**

**Filed Dec. 17, 1979, Ser. No. 104,130**

**Int. Cl.³ B23P *11/02***

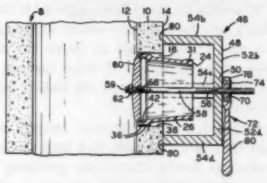
**U.S. Cl. 29—451** **12 Claims**

9. The method of connecting a gasket to a pipe, manhole, or the like having a wall with an inner surface and an outer surface and an opening extending therethrough comprising:

providing an elastomeric gasket assembly comprising a gasket, one end of which is annular and has an outer diameter larger than the inner diameter of the manhole or pipe opening, and an annular substantially rigid ring received in the annular end of the gasket member,

positioning the annular end of the assembly over the opening adjacent one of the inner and outer surfaces,

pulling the gasket assembly into the opening by means of an element extending through the gasket and opening and




engaging the annular end of the gasket assembly, wherein when the element is pulled, the gasket assembly is pulled into the opening by it, and the gasket annular end is tightly compressed between the opening and ring.

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**4,297,781**

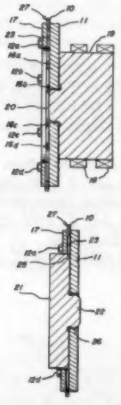
## METHOD OF ALIGNING A PRECISION GRINDING WHEEL ASSEMBLY

**Douglas J. Hennenfent, Minneapolis; Robert A. Johnson, Minnetonka, and Allan L. Holmstrand, Bloomington, all of Minn., assignors to Magnetic Peripherals Inc., Minneapolis, Minn.**

**Division of Ser. No. 927,321, Jul. 24, 1978, Pat. No. 4,236,355. This application Jul. 21, 1980, Ser. No. 170,383**

**Int. Cl.³ B23Q *3/00***

**U.S. Cl. 29—467** **2 Claims**



1. A method of assembling a grinding wheel mount assembly to be fastened to a faceplate carried on the end of a spindle mounted for rotation, said faceplate including a centering feature precisely centered on the spindle's axis of rotation, and a plurality of holes surrounding the centering projection for attachment of the assembly, wherein the assembly comprises:

a flexible grinding wheel having an annular hub having a plurality of axially directed spaced apart holes therein, and an annular ring of abrasive disposed about the rim of the hub and firmly bonded thereto, said wheel having sides parallel to each other;

a clamping plate in the shape of annular ring whose interior opening is at least the same size as the hub's central opening, having an external diameter at least that of the hub's outer diameter, having a plurality of axially directed holes substantially the size of those in the hub passing between the two faces of the plate and spaced to conjoin with those in the hub when properly oriented therewith, and having a flat side perpendicular to the axis;

a mounting disc having (i) substantially flat parallel faces, (ii) a centrally located centering feature on at least one side thereof shaped to closely mate with the faceplate's centering feature to prevent relative radial movement between the mounting plate and the faceplate when so mated, (iii) a plurality of axially directed holes located to conjoin with the faceplate's attachment holes when so mated to permit fasteners to pass therethrough to fasten the assembly to the faceplate, and a plurality of holes located to conjoin with the holes in the hub when the hub is properly oriented therewith; and

a plurality of cylinder type fasteners passing sequentially through first the clamping plate and then the hub into the mounting disc to firmly clamp the grinding wheel between the clamping plate and the mounting disc concentrically with both;

said method comprising the steps of:

(a) slipping the portion of a plug having a first radius substantially equal to that of the grinding wheel hub's inside radius into the hole of the grinding wheel's hub;

(b) mating the mounting disc's centering feature with a mounting feature identical to the faceplate's mounting feature and precisely concentric with and carried adjacent to the plug's portion having the first radius; and

(c) while maintaining said position of the plug vis-a-vis the hub and mounting disc, using the fasteners, fastening the mounting disc to the clamping plate and grinding wheel.

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**4,297,782**

## METHOD OF MANUFACTURING SEMICONDUCTOR DEVICES

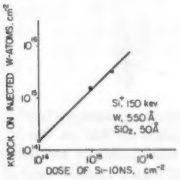
**Takashi Ito, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan**

**Continuation of Ser. No. 851,766, Nov. 15, 1977, abandoned. This application Jan. 2, 1980, Ser. No. 109,100**

**Claims priority, application Japan, Nov. 27, 1976, 51/142527; Jul. 6, 1977, 52/80846; Jul. 6, 1977, 52/80847; Jul. 6, 1977, 52/80848; Jul. 6, 1977, 52/80850**

**Int. Cl.³ H01L** *21/425, 21/263*

**U.S. Cl. 29—571** **18 Claims**




1. A method of adjusting at least one inversion threshold voltage at the surface of a semiconducting portion of a semiconductor device during the manufacture of said device, said adjusting method comprising

forming a first insulative film on said surface of said semiconducting portion,

forming a thin metallic film on said first insulative film,

bombarding said thin metallic film with an ion beam to partially inject said thin metallic film into said first insulative film to produce negative fixed charges in said first insulative film,

removing said thin metallic film, and

forming a second insulative film on said first insulative film.

**4,297,783**

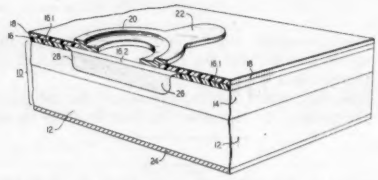
## METHOD OF FABRICATING GAAS DEVICES UTILIZING A SEMI-INSULATING LAYER OF ALGAAS IN COMBINATION WITH AN OVERLYING MASKING LAYER

**Horace C. Casey, Jr.; Alfred Y. Cho, both of Summit, and Philip W. Foy, Plainfield, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Division of Ser. No. 7,790, Jan. 30, 1979, Pat. No. 4,231,050. This application Apr. 21, 1980, Ser. No. 142,076**

**Int. Cl.³ H01L** *21/203, 21/223*

**U.S. Cl. 29—578** **9 Claims**



1. A method of fabricating a GaAs device having reduced surface recombination current comprising the steps of:

(a) growing by molecular beam epitaxy a monocrystalline, semi-insulating layer (**16**) of AlGaAs on a major surface of a monocrystalline body of GaAs (**10**), CHARACTERIZED BY

(b) forming a masking layer (**18**) on said AlGaAs layer,

(c) opening a window in said masking layer so as to expose the underlying portion (**16.2**) of said AlGaAs layer but leave adjacent peripheral portions of said AlGaAs layer covered by said masking layer,

(d) introducing impurities through said window so as to modify the conductivity of the underlying zone (**26**) of said GaAs body and to convert said underlying portion (**16.2**) of said AlGaAs layer from semi-insulating to low resistivity while leaving said adjacent peripheral portions (**16.1**) semi-insulating, and

(e) forming electrical contacts (**20,24**) to said underlying portion (**16.2**) of said AlGaAs layer and to an opposite major surface of said body.

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**4,297,784**

## METHOD FOR MOUNTING MOTOR STATORS

**Selmer Vagman, Emmaboda, Sweden, assignor to ITT Industries, Inc., New York, N.Y.**

**Filed Nov. 26, 1979, Ser. No. 97,611**

**Claims priority, application Sweden, Dec. 12, 1978, 7812730**

**Int. Cl.³ H02K** *15/14*

**U.S. Cl. 29—596** **5 Claims**

1. A method for mounting a complete motor stator in a surrounding cylindrical housing, comprising the steps of:

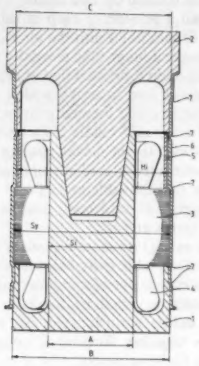
sliding the stator on top of a flanged mandrel, the rib diameter of which corresponds to the inner diameter of the stator and the flange diameter approximately corresponds with the outer diameter of the stator to form a first bearing guide for the stator housing;

sliding a second mandrel into a guiding portion of the first mandrel so that the first and second mandrels form a concentric mandrel unit having a space in which the coils of the stator are disposed, an outer diameter of the second mandrel forming a second bearing guide for the stator housing;

heating a cylindrical stator housing, the nominal inner diameter of which is somewhat less than the outer diameters of the stator and first and second mandrels to expand said housing;

sliding the heated and expanded housing over the mandrel unit;

cooling said housing whereby the housing is shrunk-fit around the mandrel unit and stator; and



loosening and removing said mandrels from the stator housing.

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**4,297,785**

## ELECTRIC STARTING AIDS FOR INTERNAL COMBUSTION ENGINES

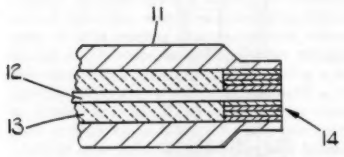
**Richard P. Knowles, Farnborough, England, assignor to Lucas Industries Limited, Birmingham, England**

**Filed Jan. 23, 1980, Ser. No. 114,589**

**Claims priority, application United Kingdom, Feb. 24, 1979, 6630/79**

**Int. Cl.³ H05B *3/00***

**U.S. Cl. 29—611** **4 Claims**




1. A method of manufacturing an electric starting aid for an internal combustion engine of the kind comprising a body adapted to be retained in a bore formed in the cylinder head of the engine, an electrically conductive tubular extension located at one end of the body, part of said extension extending in use within a combustion chamber of the engine, a central conductor rod extending through said extension, insulating means supporting said rod within the extension and a spirally wound heating element formed from metallic tape, located in the open end of said extension, said heating element being secured at its inner and outer ends to the central rod and the extension respectively, the method comprising coating the tape with a glass like substance, securing one end of the tape to the central rod and winding the tape about the central rod, inserting the wound element into the end portion of the extension, securing the rod within the extension, securing the other end of the tape to the extension, passing an electric current through the element so that the latter attains a temperature sufficient to cause softening of the glass like substance and rolling the end portion of the extension to effect a reduction in the diameter thereof.

**4,297,786**

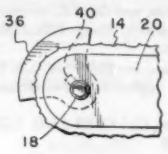
## CHAIN SAW NOSE GUARD

**Lloyd H. Tuggle, Shreveport, La., assignor to Beaird-Poulan Division, Shreveport, La.**

**Division of Ser. No. 719,597, Sep. 1, 1976. This application Jun. 3, 1980, Ser. No. 155,961**

**Int. Cl.³ B27B *17/00***

**U.S. Cl. 30—382** **4 Claims**




1. In a chain saw having a guide bar and a cutting chain disposed around a curved nose portion of the guide bar, the curved nose portion including a hole and a quadrant having a curved edge which spans approximately the upper one half of the arc described by the curved nose portion when the guide bar is oriented to extend in a generally horizontal direction, a guard assembly attached to said nose portion and overlying said quadrant, said guard assembly comprising a sector of a substantially circular disk which spans an arc at least as large as the span of said quadrant but less than said arc described by said nose portion, the curved edge of said sector projecting beyond the cutting path of the chain in a plane substantially parallel to the plane of said guide bar, said sector including a shaft disposed in registration with said hole, said shaft having a portion defining a locking key, and said nose portion having surfaces defining at least a portion of said hole and cooperable with surface portions on said key to provide for said sector to be disposed in locked engagement with said nose portion to prevent rotation of said sector with respect to said guide bar and to prevent the installation of said sector on said guide bar out of a major portion of said quadrant.

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**4,297,787**

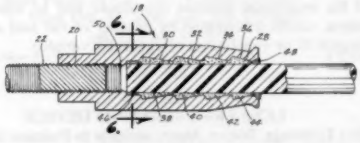
## INSULATED GAUGE ROD AND METHOD OF MAKING THE SAME

**Carlin P. Fischer, 6336 S. 72nd Ave., Omaha, Nebr. 68127**

**Filed Apr. 17, 1980, Ser. No. 141,168**

**Int. Cl.³ B61K *9/08*; E01B *35/02***

**U.S. Cl. 33—144** **5 Claims**



1. An insulated gauge rod, comprising,

a first metal rod portion having means on one end thereof for engagement with one railroad track of a pair of tracks,

a first metal hollow casting secured to the other end of said first metal rod portion,

a second metal rod portion having means on one end thereof for engagement with the other railroad track of the pair of tracks,

a second metal hollow casting secured to the other end of said second metal rod portion,

a fiberglass rod secured to and extending between said first and second castings for electrically insulating said first and second rod portions from each other, each of said castings having open opposite ends, one end of each of said castings being threadably secured to the associated

metal rod portion, the other end of each of said castings receiving one end of the said fiberglass rod,

an epoxy material securing said fiberglass rod to said casting, each of said castings including means for centering said fiberglass rod therein.

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**4,297,788**

## GEAR TESTING MACHINE

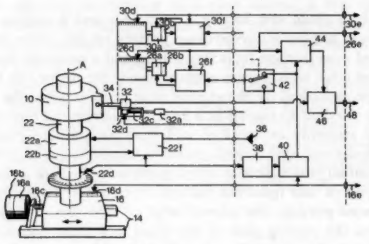
**Armin Sterki, Uetikon, and Gerd R. Sommer, Dietikon, both of Switzerland, assignors to Maag- Zahnräder & Maschinen AG, Zürich, Switzerland**

**Filed Jan. 14, 1980, Ser. No. 111,769**

**Claims priority, application Switzerland, Jan. 19, 1979, 548/79**

**Int. Cl.³ G01B** *5/20, 7/28*

**U.S. Cl. 33—179.5 R** **6 Claims**



1. Gear testing machine with drive means for relative movements between a toothed gear to be tested and a sensor connected to an electronic control and evaluation device, said means comprising a rotary drive for relative rotational movements about the axis of the gear, an axial drive for rectilinear relative movements in the direction of the axis of the gear and a tangential drive for relative rectilinear movements in the direction of a tangent to the pitch circle of the gear, each of said drives comprising a servomotor and a tachogenerator providing elements of a closed loop control system, and also a position transducer, the testing machine further comprising an electronic correction circuit which compares with each other the actual position values determined by the position transducers and corrects the test signals emitted by the sensor in conformity with the position errors thereby ascertained, at least one of said drives further comprising a second closed loop control circuit which includes the servomotor of the relevant drive and the associated position transducer and to which actual position values determined by another of the said drives are arranged to be supplied as a regulating variable.

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**4,297,789**

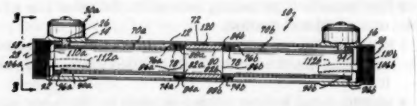
## LENS-FREE SIGHTING DEVICE

**Hideo Tominaga, Tokyo, Japan, assignor to Fontaine Industries, Inc., Garden Grove, Calif.**

**Filed Aug. 20, 1979, Ser. No. 67,907**

**Int. Cl.³ F41G** *1/38*

**U.S. Cl. 33—298** **8 Claims**



1. A lens-free sighting device which comprises:

a one-piece elongated main tube having at least one saddle integrally formed thereon and located proximal to one of the ends of said main tube, said saddle including two holes located 90 degrees apart from each other and passing through said saddle forming two accesses into the interior of said main tube;

two turret means located on said saddle, one over each of said holes such that a portion of each of said turret means pass through one of said holes into the interior of said main tube;

at least one elongated inner tube pivotally mounted within the interior of said main tube such that at least one of the ends of said inner tube is free to move within the interior of said main tube, said free end located proximal to the end of said main tube wherein said saddle is located;

said portions of said turret means passing through said holes operatively connected to said movable end of said inner tube so as to cause said movable end of said inner tube to move within the interior of said main tube in response to movement of said turret means;

a reticle means having two sections, one of said sections fixedly located on said movable end of said inner tube so as to move in response to movement of said inner tube, the other of said sections located proximal to the end of said main tube wherein said saddle is not located, said two sections of said reticle means together forming a complete reticle when viewed along the longitudinal axis of said main tube.

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**4,297,790**

## SURVEY APPARATUS AND METHOD EMPLOYING RATE-OF-TURN AND FREE GYROSCOPES

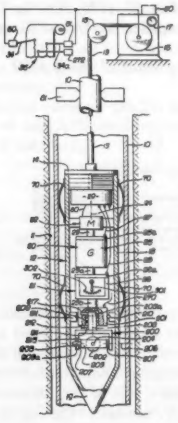
**Donald H. Van Steenwyk, San Marino; John R. Cash, and Paul W. Ott, both of Pasadena, all of Calif., assignors to Applied Technologies Associates, San Marino, Calif.**

**Continuation-in-part of Ser. No. 925,307, Jul. 17, 1978, Pat. No. 4,192,077. This application Jun. 25, 1979, Ser. No. 51,893**

**The portion of the term of this patent subsequent to Mar. 11, 1997, has been disclaimed.**

**Int. Cl.³ E21B** *47/24;* **G01C** *19/00*

**U.S. Cl. 33—313** **33 Claims**



1. In apparatus for determining azimuth, the combination that comprises

(a) a rate-of-turn gyroscope including a first rotor having a spin axis,

(b) support means to support the gyroscope for lengthwise travel along another axis and to rotate about said other axis,

(c) said gyroscope having first means for producing an output which varies as a function of azimuth orientation of the gyroscope relative to the earth's spin axis, and

(d) a free gyroscope operatively carried for movement along said other axis with said rate-of-turn gyroscope, said free gyroscope including a second rotor having a spin axis subject to re-orientation,

(e) said free gyroscope also having means for producing an output which varies as a function of azimuth orientation of the free gyroscope,
(f) other means responsive to the output of the rate-of-turn gyroscope to effect said re-orientation of the free gyroscope spin axis,
(g) control means connected with said other means to periodically cause said other means to effect said alignment, while said travel is effectively interrupted, and
(h) said support means supporting both gyroscopes for travel in a bore hole.

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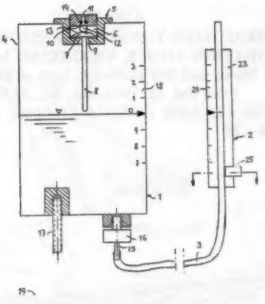
**4,297,791**

## HOSE WATER LEVELING INSTRUMENT

**Ernst W. Mende, Akazienhain 13, 518 Eschweiler, Fed. Rep. of Germany**

**Continuation of Ser. No. 897,385, Apr. 18, 1978, abandoned. This application Nov. 5, 1979, Ser. No. 91,407**
**Claims priority, application Fed. Rep. of Germany, Apr. 19, 1977, 2717347**
**Int. Cl.³ G01C 9/22, 5/04**
**U.S. Cl. 33—367** **5 Claims**



1. A hose water leveling instrument, comprising a liquid-filled hose; a fixable reference instrument, permanently filled with measuring liquid and connected to one end of said hose; a freely movable reading instrument connected to the other end of said hose; said hose connecting said reference instrument to said reading instrument; said reference instrument having a fully transparent housing for displaying the level of said measuring liquid, said housing having a plane rear side for directly contacting a mounting wall with a reference level to be transmitted, said transparent housing having a measuring scale section located next to said plane rear side and being readable from different directions, said housing having a substantially slender cylindrical shape with uniform diameter and a cross-section comprised of a substantially semi-circular area and a triangular area bounding the diameter of said semi-circular area, said diameter having a magnitude so that said housing can be easily grasped and enclosed by hand; and a single automatically opening and closing venting valve for preventing run out of said liquid and being located in said reference instrument; a valve chamber with a wall, said venting valve comprising a plane-convex body located in said valve chamber, said body on its plane surface facing said valve chamber wall and having a lever loaded with weight; said lever having a convex surface located inside said valve chamber; a ball-shaped closure member; venting aperture means with a conical valve seat; said lever in horizontal position of said reference instrument forcing said ball-shaped closure member against said valve seat and forming a linear seal when said plane-convex body due to the weight of said lever is pivoted about a fulcrum on the periphery of said plane-convex body so that a dust particle will be forced out of the contact surface between said closure member and said valve seat, said plane-convex body hanging vertically in a vertical position of said reference instrument to the weight of said body and said lever, the plane surface of said body being in full contact with said valve chamber wall without exerting force on said closure member, said closure member dropping out of said venting aperture means due to the weight of said closure member; at least said plane-convex body being comprised of magnetic material, said closure member being comprised of ferrous material.

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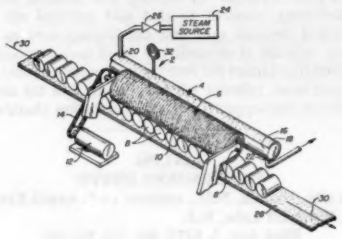
**4,297,792**

## MODIFIED JAR DRYER

**Elton H. Harter, San Jose, Costa Rica, assignor to Gerber Products Company, Fremont, Mich.**

**Filed Apr. 16, 1980, Ser. No. 140,917**
**Int. Cl.³ F26B 3/24**
**U.S. Cl. 34—12** **10 Claims**




1. A dryer for drying the surface of an object comprising a brush having a plurality of bristles extending from the backbone thereof; means for spinning said brush around its backbone so that a portion of said bristles wipe across the surface of said object to remove liquid from the surface of said object, and means for directly heating at least the outer ends of said bristles as their outer ends traverse the surface of said direct heating means, said direct heating means adapted to engage said bristles so that as said bristles disengage from said surface of said direct heating means said bristles spring back, thus causing liquid to be removed from said bristles, and thereby enhancing the drying performance of said dryer.

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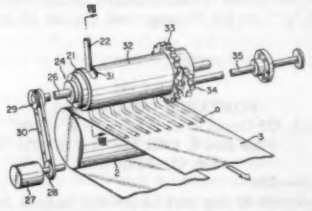
**4,297,793**

## APPARATUS FOR SUPPLYING MATERIALS TO BELT TYPE CONTINUOUS VACUUM DRYER

**Yukihiro Saiki, Saitama; Eitaro Kumazawa, Sayama, and Yozo Ishioka, Higashikurume, all of Japan, assignors to Snow Brand Milk Products Co., Ltd., Sapporo, Japan**

**Filed Feb. 13, 1980, Ser. No. 120,950**
**Int. Cl.³ F26B 15/18**
**U.S. Cl. 34—56** **5 Claims**



1. An apparatus provided above a movable belt inside a vacuum drying chamber and adapted for supplying material onto the belt, which comprises:
an inner cylinder equipped with a material-supplying duct for supplying material into said inner cylinder adjacent to one end thereof, a distributing chamber formed inside said

inner cylinder and communicating with said duct and a plurality of first distributing nozzles on the lower part of said inner cylinder and communicating with said distributing chamber for discharging said material from said distributing chamber;

an outer cylinder sleeved on and mounted for rotation relative to said inner cylinder, said outer cylinder having a plurality of second distributing nozzles provided at positions corresponding to the positions of said first distributing nozzles on said inner cylinder, said second distributing nozzles on said outer cylinder being adapted for cooperative registration with said first distributing nozzles on said inner cylinder to regulate the amount of material discharged from said distributing chamber;

a rotatable screw feeder inside said distributing chamber of said inner cylinder for feeding said material along said distributing chamber so that said material can be discharged through said first distributing nozzles on said inner cylinder at substantially equal linear velocities; and

a driving mechanism for rotating said outer cylinder relative to said inner cylinder whereby to regulate the amount of material discharged from said distributing chamber.

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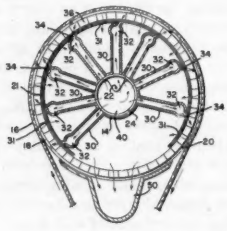
**4,297,794**

## PAPER SHEET DRYER

**Oscar Luthi, Nashua, N.H., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.**

**Filed Aug. 2, 1977, Ser. No. 821,167**
**Int. Cl.³ F26B *11/04***
**U.S. Cl. 34—122** **16 Claims**



1. A dryer for drying a continuous sheet of paper fibers comprising: a rotatable drum; a high percentage open area sheet support on the outside of said drum; means for feeding the sheet to the rotatable drum and means for removing the sheet from the drum at an area circumferentially spaced from the means for feeding the sheet to the rotatable drum, thus providing a sheet-drum contact arc; means for feeding hot gas into the inside of the rotatable drum; said sheet support having means for conducting hot gas from the inside of the drum against the inside of the sheet, and along the inside surface of the sheet; and means circumferentially spaced from said sheet-drum contact arc for flowing used gas out of the rotatable drum.

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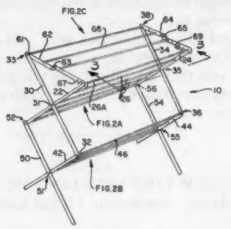
**4,297,795**

## PORTABLE DRYING RACK

**Vito Licari, 875 Ocean Ave., Elberon, N.J. 07740**

**Filed Jun. 6, 1980, Ser. No. 157,004**
**Int. Cl.³ F26B *9/10***
**U.S. Cl. 34—239** **7 Claims**

1. A portable drying rack of molded integral construction comprising, a pair of molded supporting members, first and second unitary frames each molded to include a pair of parallel spaced frame members and a plurality of connecting members extending transversely therebetween, integrally molded attachment means pivotally attaching said supporting members to the frame members of said first frame in parallel spaced relationship for pivotal movement between a folded and cruciform configuration, said second pivotally attached at one end between said supporting members and said first frame for bracing said supporting members and said first frame when in said cruciform configuration and collapsible therewith when in



said folded position, and securing means formed at one end of said second frame for releasably securing said supporting members and said first frame in said cruciform configuration.

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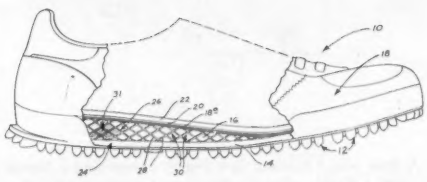
**4,297,796**

## SHOE WITH THREE-DIMENSIONALLY TRANSMITTING SHOCK-ABSORBING MECHANISM

**Ronald H. Stirtz, and Bill Dellinger, both of Eugene, Oreg.**

**Filed Jul. 23, 1979, Ser. No. 59,578**
**Int. Cl.³ A43B *13/18, 13/12, 13/04, 21/32***
**U.S. Cl. 36—28** **3 Claims**



1. In an article of footwear including means defining a deformable foot-cushioning inner sole expanse portion bounded by a rim portion which is disposed at an angle relative to said expanse portion,

plural elongated stretch-resistant strands distributed over at least a part of said expanse portion and folded over at least a part of said rim portion, and

bonding means distributed over said expanse and rim portions producing force-transmission bonds between said portions and said strands along the lengths of the strands, whereby, with a wearer's foot tending to produce a localized deformation in said expanse portion, said strands distribute such deformation to other regions in said expanse portion and to regions in said rim portion through force transmission and distribution via said bonds.

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**4,297,797**

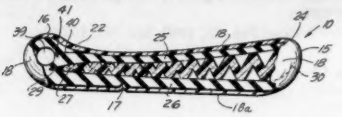
## THERAPEUTIC SHOE

**Stuart R. Meyers, 2910 Wallace Ave., Bronx, N.Y. 10467**

**Filed Dec. 18, 1978, Ser. No. 970,010**
**Int. Cl.³ A43B *13/40, 13/20***
**U.S. Cl. 36—44** **6 Claims**

1. A therapeutic shoe comprising an insole member being formed with a first portion comprising a fluid tight chamber at the medial portion to exert pressure on the medial portion of the foot, and a second portion comprising a plurality of fluid tight chambers being compressible at the lateral portion of the foot, and a third portion comprising a compressible metatarsal

portion, wherein the lateral and metatarsal portions are more compressible than the medial portion, whereby the weight of a



foot undergoing compression in the lateral and metatarsal portion forms a medial arch.

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**4,297,798**
**FOOTWEAR SYSTEM**
**Laura P. Colan, 400 E. 57th St., New York, N.Y. 10022**
**Filed Feb. 12, 1980, Ser. No. 120,883**
**Int. Cl.[3] A43B *3/24, 3/12;* A43C *13/00***
**U.S. Cl. 36—101** **9 Claims**

1. An improved footwear system comprising a sole assembly including a base portion defining the shape of the sole and having an outer edge perimeter wall; a stepped inset portion atop said perimeter wall along substantially the entire length of said perimeter wall defining a ledge, a vertical wall extending upward at substantially a right angle to said ledge; a ridge section, said ridge section extending outward from said vertical wall along a height substantially intermediate thereof; said ridge extending substantially parallel to said perimeter wall of said base portion and laterally inward thereof; a plurality of vertical slots extending through said ridge portion with each said slot adapted to permit said lacing material to pass therethrough; and a top portion adapted to extend substantially parallel to said bottom portion, the outer edge portion of said top portion adapted to overlie said ridge in spaced apart relationship thereto; whereby said ledge portion and its said vertical wall and said outer edge portion of said top portion define a substantially E shaped channel having a slotted central arm therein to permit the releasable affixation of shoe upper material thereto.

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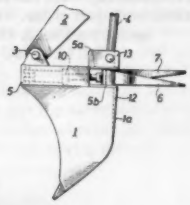
**4,297,799**
**APPARATUS FOR DIGGING POST HOLES AND ERECTING POSTS**
**John T. Sonerud, Hudiksvall, Sweden, assignor to Soneruds Maskin Aktiebolag, Hudiksvall, Sweden**
**Filed Feb. 25, 1980, Ser. No. 124,640**
**Int. Cl.[3] A01B *13/00***
**U.S. Cl. 37—2 R** **4 Claims**

1. Apparatus for digging post holes and erecting posts or poles, characterized by a post hole digging shovel (**1**) on which there is pivotably mounted gripping means (**6, 7**) for gripping a post and consisting of at least one gripping arm (**6, 7**), the shovel having a spine (**1***a*) which is provided with a substan-



tially V- or U-shaped recess (**12**) forming a seat for the pole, the gripping means (**6, 7**) being arranged above said spine.

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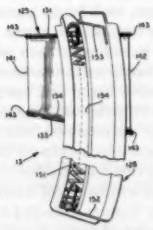
**4,297,800**
**CARTRIDGE MAGAZINE FOR FIREARMS**
**Maxwell G. Atchisson, 55 Old Yellow Springs Rd., Fairborn, Ohio 45324**
**Division of Ser. No. 830,607, Sep. 6, 1977, Pat. No. 4,169,329.**
**This application Aug. 27, 1979, Ser. No. 69,725**
**Int. Cl.[3] F41C *25/02***
**U.S. Cl. 42—49 A** **4 Claims**



1. A cartridge magazine for use with a firearm that has a magazine receiving receptacle to accept a magazine containing cartridges of a certain caliber and that has been converted to fire cartridges of a second caliber, said cartridge magazine comprising:

a magazine housing configured to be operatively received in the magazine receptacle of the firearm;

said magazine housing comprising a flat plate which is bent along an upper pair of approximately horizontal laterally spaced apart lines and which is additionally bent along a lower pair of approximately horizontal laterally spaced apart lines so that the spacing on the plate between the upper and lower pairs of bend lines defines the sides of said magazine housing, and so that the lateral separation between bend lines of each said pair respectively defines the top surface and bottom surface of said magazine housing; and

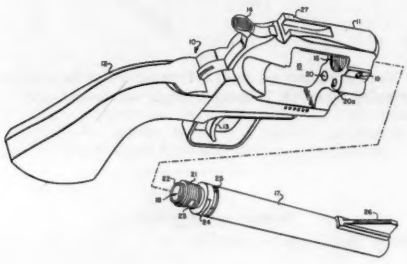
a cartridge magazine extending through and attached to said top and bottom surfaces of said magazine housing.

4,297,801

## FIREARM WITH INTERCHANGEABLE BARRELS AND AMMUNITION CYLINDERS

Harvey R. Kahn, Port Jefferson, N.Y., assignor to Alan I. Gerald Corporation, North Haven, Conn.

Continuation-in-part of Ser. No. 35,992, May 2, 1979. This application Dec. 3, 1979, Ser. No. 99,846
Int. Cl.[3] F41C *1/00, 21/00*
U.S. Cl. 42—59 4 Claims



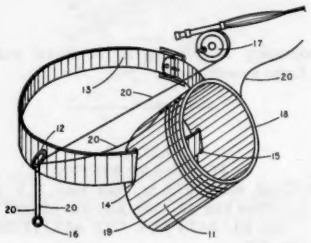
1. In a firearm of the type having a frame for mounting a multiple chamber ammunition cylinder, said frame having a rear sight mounted thereon, and a threaded frame bore for removably mounting a barrel, a plurality of said ammunition cylinders with each of said cylinders being adapted for use with a different caliber ammunition, means for selectively mounting any one of said plurality of cylinders for revolution on said frame, a plurality of barrels, each said barrel having a different diameter barrel bore therethrough corresponding to a different caliber of ammunition associated with one of said plurality of cylinders, each barrel having a thread engageable in said frame bore and located at one end of said barrel for allowing selective mounting of each said barrel in said frame bore, longitudinal barrel extension means located on said one end of each respective barrel and being operative when said respective barrel is fully threadedly engaged in said frame bore for interfering with the mounting and revolution of any said cylinder in said frame which cylinder corresponds to a caliber of ammunition larger than the caliber of the barrel bore of said respective barrel, an improvement which comprises a plurality of interacting safety features including a barrel alignment mark located adjacent each said barrel thread on each of said barrels, a frame alignment mark located on said frame for alignment with said barrel alignment marks when each said barrel is fully threadedly engaged in said threaded frame bore to insure full threaded engagement and thereby the operativeness of each said extension means, a plurality of sight ribs, each said rib corresponding to a different said barrel, means for attaching each said sight rib to its corresponding barrel at a predetermined location on each said barrel to enable each said sight rib to be operatively oriented with respect to said rear sight for aiding aiming of said firearm when each said barrel is fully threadedly engaged in said frame bore, and means for inhibiting attachment of each said sight rib to its corresponding barrel when each said corresponding barrel is only partially engaged in said frame bore for allowing attachment of each said sight rib to its corresponding barrel only after each said barrel is fully threadedly engaged in said frame bore to require that attention be directed to the degree of engagement between a said barrel and said frame bore in order to attach each said sight rib.

4,297,802

## LINE ROUTING AND STORING DEVICE

Carl N. Normann, 1503 Fulton Ave., Apartment 91, Sacramento, Calif. 95825

Filed Jun. 23, 1980, Ser. No. 162,184
Int. Cl.[3] A01K *97/00*
U.S. Cl. 43—4 3 Claims



1. A line routing and storing device comprising line-guiding means, line-tensioning means, non-rotating arbor, and locating-and-fastening means for securing said line-guiding means and arbor about the waist-line of a fisherman; said arbor to be positioned and oriented so that its axis points in a suitably forward and upward direction from said waist-line; said line-guiding means and line-tensioning means to be suitably and remotely positioned from said arbor, and to be operably connected by said line between a conventional fly-reel, conventionally mounted on a fly-rod, and said arbor onto which said line is wound by hand.

4,297,803

## COMPOSITION USEFUL FOR INHIBITING ADHESION AND PROPAGATION OF UNDESIRABLE ALGAE AND/OR SHELLFISH ON ARTICLES

Norio Saito, No. 1019 Shimizudani, Takatori-cho, Takaichi-gun,Nara-ken, Japan

Filed Mar. 14, 1980, Ser. No. 130,590
Claims priority, application Japan, Mar. 16, 1979, 54-31327
Int. Cl.[3] A01K *74/00*
U.S. Cl. 43—7 14 Claims

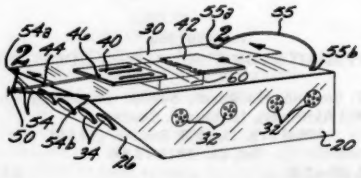
1. A composition for inhibiting adhesion of undesirable algae and/or shellfish to and propagation thereof on articles, which composition comprises an organic solvent solution of (a) triisobutyltin hydroxide and (b) an arylsulfonic acid derivative and wherein the weight ratio of (a):(b) is from 1:1 to 1:1.5, (a) being reactive with (b) to form a water-insoluble reaction product.

4,297,804

## CHUMATE

David B. Weld, 3829 Carfax Ave., Long Beach, Calif. 90808

Filed Dec. 3, 1979, Ser. No. 99,561
Int. Cl.[3] A01K *97/04*
U.S. Cl. 43—55 5 Claims



1. An aquarium-type floating bait tank including:

an enclosed boat-shaped container having oppositely disposed top and bottom walls suitable for high speed pulling, holding water and carrying live bait therein, said container being made substantially of transparent material so that bait carried within it can be seen from surrounding water when floated therein;

said enclosed container having aeration holes positioned to supply fresh air to water carried therein, a bait opening in the top wall of said container, drain holes in the bottom wall of said container and plug means to selectively close said drain holes;

flotation means mounted on said container adapted to hold it at preselected floating levels when in water;

a closable door mounted on said container so as to be able to seal shut said bait opening in the top wall thereof; and

a towing rope connected on one end to said container, a closing line connected between said towing rope and said closable door wherein said closing line connections are predeterminedly positioned so that when said towing rope is pulled tight the connected closing line will automatically pull said door closed and when loosened said door can be opened.

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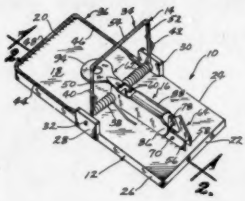
**4,297,805**
**ANIMAL TRAP**

**Lester E. Kness, Granger; Marvin E. Kness, and Arnold A. Kness, both of Albia, all of Iowa, assignors to Kness Manufacturing Co., Inc., Albia, Iowa**

**Filed May 12, 1980, Ser. No. 149,188**
**Int. Cl.³ A01M *23/30***
**U.S. Cl. 43—83.5** **9 Claims**



1. An animal trap comprising:

a base having an upper surface, opposite sides, and opposite ends;

a jaw member pivotally mounted on said base for pivotal movement about a first horizontal axis from a cocked position to a sprung position, said jaw member having at least one horizontal bar extending transversely of said base and being movable in an arc during said pivotal movement of said jaw member,

spring means yieldably urging said jaw member to said sprung position;

a catch member pivotally mounted to said base for pivotal movement about a second horizontal axis, said catch member having a catch pawl thereon for retentively engaging said bar when said jaw member is in said cocked position,

said catch member being pivotal about said second horizontal axis from a catch position wherein said catch pawl retentively engages said bar in said cocked position to a release position wherein said catch pawl moves out of retentive engagement with said bar,

a trip member pivotally mounted on said base for pivotal movement about said first horizontal axis, said trip member having a catch receiving surface, said trip member being pivotal about said axis from a set position wherein said catch receiving surface engages said catch and holds said catch against movement from said catch position, said trip member being pivotal to a trip position wherein said catch receiving surface frees said catch member for movement to said release position, thereby freeing said jaw member for movement to said sprung position,

a reset member pivotally mounted to said base for pivotal movement about said second horizontal axis, said reset member including a foot at one end thereof and a reset cam, said reset cam being engageable with said bar during movement of said jaw member to said cocked position, said reset member being rotatable in response to said engagement between said bar and said reset cam so as to cause said foot to engage said trip member and move said trip member to said trip position whereby said catch member will fall by gravity to said release position.

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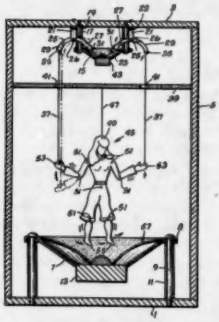
**4,297,806**
**DANCING DOLL**

**Edward A. Ilkeagla, 12212 Calendula Ave., Fountain Valley, Calif. 92708**

**Filed Nov. 23, 1979, Ser. No. 96,654**
**Int. Cl.³ A63H *33/00***
**U.S. Cl. 46—1 C** **10 Claims**



1. A dancing doll, comprising:

a stage having an overhead;

a speaker having a diaphragm, supported from said overhead;

at least one fulcrum attached to said overhead;

at least one lever arm pivotally attached to said fulcrum so that the inboard end of said at least one lever arm touches said diaphragm portion of said speaker;

an articulated doll; and

flexible means attached to the outboard end of said at least one lever arm and connected to a portion of said articulated doll.

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**4,297,807**
**TOY GAME BANK**

**Larry H. Buettner, 6146 Blackwall, Troy, Mich. 48098**

**Filed Feb. 4, 1980, Ser. No. 118,199**
**Int. Cl.³ A63H *33/00*; A63F *9/14***
**U.S. Cl. 46—4** **6 Claims**

1. A coin toy game comprising:

(a) a supporting base member having a coin receiving interior chamber;

(b) a vertical wall member mounted on the supporting base member;

(c) means on said vertical member and supporting base member which forms a vertical coin track system, including a zig-zag coin path portion, through which a coin will roll by gravity and which has an upper end and a lower end terminating adjacent an opening in the supporting base member which communicates with the supporting base member interior chamber;

(d) a funnel means carried by said vertical wall member in a position above the supporting base member and communi-

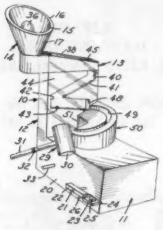
cating at the lower end thereof with the upper end of said coin track system;

(e) mechanical coin propelling means mounted on said supporting base member for propelling a coin upwardly into said funnel means for passage therefrom into said coin track system and thence into the supporting base member interior chamber;

(f) said mechanical coin propelling means is a manually operated propelling means;

(g) said mechanical coin propelling means including

(1) a lever pivotally mounted on the supporting base member and having a coin receiving surface for disposing a coin thereon; and,



(2) means operatively mounted on said supporting base member for pivoting said lever, whereby a coin disposed thereon will be propelled upwardly into said funnel means; and,

(h) said means for pivoting said lever comprising a mallet having a handle pivotally mounted on the supporting base member and a mallet head on the handle for striking one end of said lever, whereby when the handle is manually pivoted downwardly, the mallet is raised upwardly to a position above said lever, and when the handle is released the mallet falls by gravity downwardly and strikes the lever.

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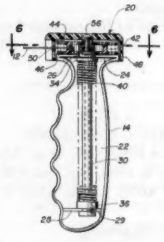
**4,297,808**

## TETHERED TOY FOR ORBITAL MOVEMENT

**Bruce M. D'Andrade, Whitehouse Station, N.J., assignor to Arco Industries Ltd., Hong Kong**

**Filed Jun. 6, 1980, Ser. No. 157,179**
**Int. Cl.³ A63H *5/00***
**U.S. Cl. 46—52** **2 Claims**



1. A whirling type toy comprising in combination a toy body adapted to be whirled through a circular orbital path in the atmosphere around a hollow handle composed of complementary molded halves and adapted to be supported manually by a human being, a circular inverted cup-shaped head supported rotatably by one end of said handle for rotation about the axis of said handle, a drum mounted within said head for rotation about the axis of said handle, a flexible tethering cord coiled from one end around said drum and having the other end of said cord connected to said toy body, an elongated coiled torsional spring extending axially within said handle and interconnected at one end to said drum, a shaft extending axially within said handle and fixed at one end to said head for rotation within said handle when said head is rotated around the axis of said handle to whirl said toy body through said orbital path and the other end of said spring being fastened to said shaft, an upper hub having a bearing opening rotatable about the upper end of said shaft and fixed to said drum and the upper end of said spring being fixed to said upper hub and thereby being fixed to said drum, a lower hub of a similar diameter to said upper hub fixed to the lower end of said shaft and the lower end of said spring being fixed to said lower hub, the upper end of said handle and lower end portion of said handle having transverse webs provided with bearing openings within which upper and lower hubs respectively are rotatable, the transverse web at the upper end of said handle having a diameter slightly less than the inner diameter of said head and coaxial therewith and said upper hub being rotatable within the bearing in said upper web and around said shaft in a manner to maintain the upper end of said handle free of contact with said head, the coil of said spring being in a direction to yieldably resist said cord being extended from said drum but yieldable to centrifugal force generated incident to rotating said toy body to assume said orbital path about the axis of said handle, and the extension of said cord from said head by centrifugal force causing rotation of said drum in a direction to rotate the upper end of said spring connected thereto to energize said spring in a manner to retract said cord around said drum when said centrifugal force is decreased.

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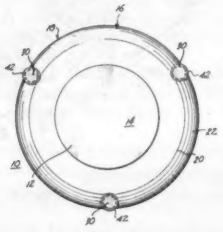
**4,297,809**

## CHIRPING FLYING SAUCER

**Charles R. Branson, P.O. Box 216, Seahurst, Wash. 98062**

**Filed Dec. 20, 1979, Ser. No. 105,519**
**Int. Cl.³ A63H *27/00***
**U.S. Cl. 46—74 D** **4 Claims**



1. A saucer shaped flying toy to be sailed through the air and rotated about an axis of rotation, comprising:

a circular central disk having an upper surface;

a depending rim positioned concentrically about the central disk and having an outer surface;

a curved transition portion positioned between the central disk and the rim, said transition portion having a convex upper surface which provides a smooth transition between the upper surface of the central disk and the outer surface of the rim;

a pneumatically-operated bi-directional whistle device projecting about said convex upper surface and having a whistle chamber comprising a substantially cylindrical-shaped hollow body having an axis aligned substantially parallel to said axis of rotation and having an elongated slot orifice located in the side of said hollow body in a plane which is tangent to a cylinder formed around said axis of rotation at the periphery of said toy, said hollow body extending outwardly from the toy into the air, said orifice having a sharp edge bordering the perimeter thereof and being aligned so that, when the toy is rotated

in either direction about its axis of rotation, the whistle device is intermittently operated; and

protective bumper means located adjacent said elongated slot orifice protecting said orifice from damage.

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**4,297,810**

## SPRAYABLE HYDROMULCH

**William B. Hansford, 109 May St., Somerset, Ky. 42501**

**Filed Mar. 3, 1980, Ser. No. 126,412**
**Int. Cl.³ A01G *7/00***
**U.S. Cl. 47—9** **15 Claims**

1. A pumpable hydromulch composition suitable for use in soil reclaimation, which comprises, on a dry weight basis:

Hay 80–90%
Paper Stock 10–17%
Binder up to 1.5%
Coloring Agent up to 1.5%

wherein said hay fibers are no greater than about 6 inches in length, and wherein said paper stock is in the form of particles of an average size no greater than about 1 inch in both dimensions.

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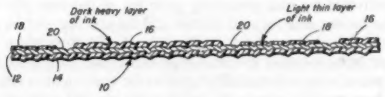
**4,297,811**

## LAMINATED PRINTED FOIL FLOWER POT WRAP WITH MULTICOLOR APPEARANCE

**Donald E. Weder, Highland, Ill., assignor to Seven W Enterprises, Inc., Highland, Ill.**

**Filed May 19, 1980, Ser. No. 151,421**
**Int. Cl.³ B32B *3/10, 3/28, 15/08***
**U.S. Cl. 47—72** **4 Claims**




1. A decorative wrapping material or the like in the form of a flexible panel member having a multicolor appearance comprising a surface on said member, a relatively thick layer of colored ink on certain areas of the surface and relatively thin layer of colored ink, of the same color as the thicker layer on other areas of the surface thereby providing a single color having areas of varying intensity thereby producing a multicolor effect on the surface, and a thin layer of plastic material laminated to the flexible panel member on the surface opposite from the colored layer, said flexible panel member being a flexible metallic foil, the relatively thick areas and the relatively thin areas of colored ink being delineated from each other by an uncoated area of the metallic foil enabling it to be observed and enhancing the variation in color intensity between adjacent areas.

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**4,297,812**

## STORM DOOR ASSEMBLY

**Shelvey C. McPhail, 4924 NW. 31st St., Oklahoma City, Okla. 73122**

**Filed Jul. 25, 1979, Ser. No. 60,787**
**Int. Cl.³ E05F *1/10***
**U.S. Cl. 49—386** **12 Claims**

1. A storm door comprising:

a pair of opposed, parallel, hollow, elongated side rails;

a hollow header extending between and interconnecting the side rails at one of their ends;

a bottom rail extending between and interconnecting the side rails at their opposite ends;

a hollow center mullion extending between said side rails and parallel to said header and bottom rail, said center mullion including

a front plate;

a bottom plate;

a top plate having a recess therein;

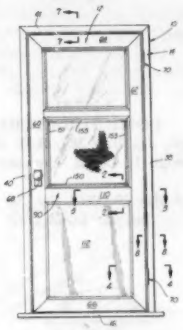
a resilient sealing pad mounted on said top plate and including a portion retained in said recess; and

a removable inspection plate extending substantially parallel to said front plate and removably engaging said top plate and said bottom plate;

a kick plate between said center mullion and said bottom rail;

a spring return subassembly having a major portion thereof enclosed within one of said rails, header and center mullion;

a latch subassembly mounted on one of said side rails and including a part slidably and reciprocably movable on said one side rail in a direction parallel to the length of said one side rail, said part positioned for engaging said spring return subassembly in one position of the part to inactivate said spring return assembly;



a slidable window sash subassembly slidably mounted between said side rails and resting in one portion upon said resilient sealing pad; and

a screen subassembly extending between said side rails at a position to overlie and extend parallel to said window sash subassembly when said window sash subassembly rests upon said resilient sealing pad, said screen subassembly including

an expanded metal grille;

a screen extending parallel to said expanded metal grille; and

means extending around and receiving edges of said grille and screen to retain them in their positions relative to each other.

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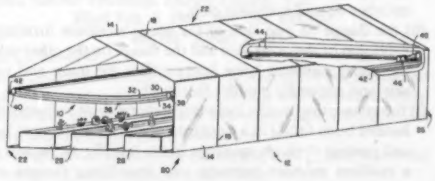
**4,297,813**

## MULTIPLE LAYER INSULATION COVER

**James J. Farrell, Livingston Manor, and Anthony J. Donohoe, Ovid, both of N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.**

**Filed Jan. 9, 1980, Ser. No. 110,575**
**Int. Cl.³ E04B *1/345;* A01G *9/00***
**U.S. Cl. 52—2** **7 Claims**



1. A multiple layer insulation cover for preventing heat losses from the interior of a building, said cover comprising:

a. four layers of flexible cloth backed metal foil;
b. first and second elongated air bladders in said cover spaced from each other and extending along longitudinal edges of said cover, said layers of said cover being spaced apart from each other by inflation of said bladders;
c. support tubes extending along the interior of the building, said tubes including axially extending slots and supporting said cover as said cover is deployed in said building;
d. T-shaped strips secured to outer edge portions of said cover adjacent said air bladders, said T-shaped strips cooperating with said support tubes to support said cover;
e. means for inflating said air bladders when said cover is deployed to space said layers; and
f. means to move said cover between deployed and storage positions.

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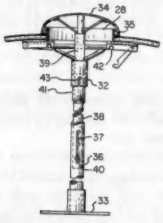
**4,297,814**

## DOME STRUCTURE

**Jerome Tomassetti, Jr., Box 288, R.D. #1, Canonsburg, Pa. 15317, and Adolph F. Lerch, Lynwood Dr., Valencia, Pa. 16059**

**Filed May 29, 1979, Ser. No. 42,810**
**Int. Cl.³ E04B *1/32***
**U.S. Cl. 52—81** **5 Claims**



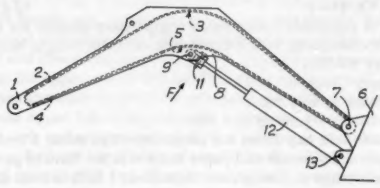

1. A dome structure comprising:
(a) a base;
(b) a plurality of side by side preformed and pre-arched panel members, at least a part of which taper from a wide base to a narrow top forming an apex;
(c) a stabilizer ring mounted on a removable stabilizer pole forming an apex of a dome spaced from the base;
(d) a pair of interfitting flanges on the opposite sides of each preformed and pre-arched panel member;
(e) an arched riser beam fixed to one side of each panel member adjacent one of said flanges;
(f) resilient connecting means engaging and joining said riser beam and a pair of interfitting flanges on each adjacent pair of panel members for connecting the same together;
(g) releasable locking means between the stabilizer ring and each panel member, releasably fastening each said panel member to said stabilizer ring;
(h) the flange on one side of the panel members forming an extension of the outer skin and the flange on the other side of the panel members lying intermediate the inner and outer skin and generally parallel therewith;
(i) the connecting means including a plurality of hemispherical headed bolts fitting in a hemispherical hole in the riser beam and passing through openings in the interfitting flanges and a resilient member between said interfitting flanges over their entire length; and
(j) an elongate trim cap frictionally engaging the bolts and panel members opposite the riser beam.

**4,297,815**

## POWER ARM FITTED WITH COUPLING DEVICES FOR A MEMBER PROVIDED TO CONTROL ITS POSITION

**Christian D. Moro, Saint Pathus, and Daniel G. Ranini, Varreddes, both of France, assignors to Poclain, Belleville, France**

**Filed Dec. 12, 1979, Ser. No. 102,894**
**Claims priority, application France, Dec. 29, 1978, 78 36909**
**Int. Cl.³ B66C *23/06*; E02F *5/02***
**U.S. Cl. 52—115** **2 Claims**




1. A power arm comprising four faces, generally parallel in pairs, two of which are constituted by plates, said arm being mounted to pivot, with respect to a structure, about an axis substantially perpendicular to the said plates, and being fitted with a tubular coupling lug of a jack controlling its position with respect to the said structure, said plates each having an integrally formed extending portion intermediate the length of said arm and extending beyond the faces of said arm, said lug comprising a jack pivoting device and its support, permitting a deflection of said jack which is substantially parallel to the deflection of the arm with respect to the structure, and which is constituted by said extending portions of the said plates, a tubular cross piece located within said tubular lug and having flat ends which are normal to the axis of said cross piece and located between said extending portions, the length of said cross piece being substantially equal to the spacing between the extending portions so as to act as a brace and prevent the portions from turning inwardly, said tubular lug being mounted on said cross piece for relative rotation with respect thereto, said tubular lug being of shorter length than the distance between said extending portions of said plates so as to permit free rotation of said tubular lug, and said cross piece prevents friction braking between said plate portions and said lug, said cross piece having an axis therein and which axis is provided with a threaded end, cooperating with a nut, to hold the cross piece in position between the said extending portions.

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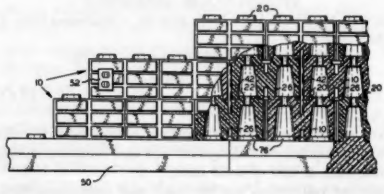
**4,297,816**

## INTERLOCKING CONSTRUCTION BLOCK

**George Kella, 3205 Happy Valley, Jackson, Mich. 49203, and Michael D. Kella, 7654 Carynway, Parma, Mich. 49269**

**Filed Jul. 12, 1979, Ser. No. 56,895**
**Int. Cl.³ E04C *1/10, 1/30***
**U.S. Cl. 52—125** **1 Claim**




1. A thermally insulated interlocking construction block of rectangular configuration having lateral faces, ends, an upper side and a lower side, a pair of tapered projections defined on said upper side extending therefrom each having an axis and a wall surface converging in a direction away from said upper

side, said projections each having a diametrical base dimension adjacent said upper side, a pair of tapered recesses each having an axis defined in said block intersecting said lower side, the axes of a projection and recess being coincident, said recesses each including a tapered wall surface at the intersection with said lower surface having a maximum diametrical dimension at said intersection slightly greater than said projection base dimension for nesting with the projection of a similar block, said recesses' wall surface tapering toward the coincident projection and axially aligned therewith terminating in an upper wall transversely disposed to the associated recess axis and in close proximity to said block upper side, an opening defined in each projection intersecting the associated recess upper wall and of a diameter less than that of the associated recess upper wall and large enough to receive a finger whereby said upper walls defines a finger grippable ledge when a finger is inserted through an opening, said projections and recesses being spaced from each other in the direction of the length of said block and equally spaced on opposite sides of a plane extending through the midpoint of the block perpendicular to the block's length, an elongated semi-cylindrical groove defined in each end of said block intersecting said upper and lower sides and having an axis lying within the plane parallel to said block faces and equidistant therebetween whereby the grooves of contiguous blocks define a locking pin receiving bore, a pin receiving bore defined in said block's upper side equidistant between said faces and ends of the associated block, a blind recess defined in said block upper side intermediate said lateral faces and projections defining a vertical wall adjacent each face inwardly spaced from the adjacent face and substantially parallel thereto whereby a fastener may be inserted through a recess wall to attach said block to support structure, said pin receiving bore intersecting said blind recess.

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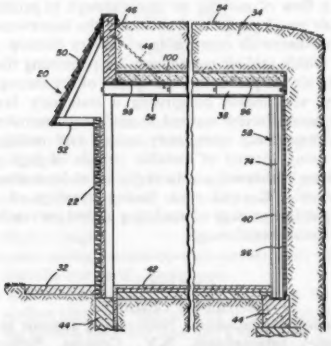
**4,297,817**

## EARTHEN-COVERED STRUCTURE AND PANEL USED THEREIN

**Ralph Bullock, and Orland E. Skibinski, both of P.O. Box 78, Irvington,, Ill. 62848**

**Filed Mar. 4, 1980, Ser. No. 127,257**
**Int. Cl.³ E02D *27/00***
**U.S. Cl. 52—169.6** **4 Claims**



1. An earthen-covered building structure comprising a floor, upstanding peripheral wall and a roof, said wall including a front portion exposed to ambient atmosphere, all of the other wall portions and roof being covered by a layer of earth of substantial thickness to substantially reduce the quantity of energy necessary to maintain conditions comfortable to the occupants of the building structure, and a water impervious member covering the exterior of the roof and walls engaged by the earth, said roof and walls being constructed of a plurality of panels, means sealing the peripheral edges of said panels, means on the periphery of each panel for interlocking engagement with the edge of an adjacent panel, each panel comprising a plurality of generally parallel spaced studs interconnected by end members, a sheet of substantially rigid plywood attached to opposite surfaces of the studs and end members to define a hollow core panel, and an encapsulating material completely covering the exterior surfaces of said sheets, said encapsulating material being a glass fiber reinforced plastic, each of the roof panels having studs with a higher central section to form parallel shallow crests and valleys, said plywood sheets being nailed and glued to said studs and end members to provide an integrated panel which is capable of limited deflection under load without cracking or failure, said roof and wall panels forming the only load bearing components of the building structure.

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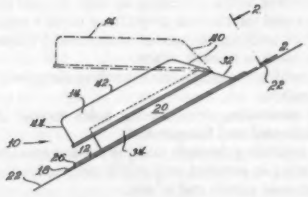
**4,297,818**

## ROOF VENTILATING LOUVER

**William J. Anderson, Taylorsville, Miss., assignor to Anderson Metal Products Corp., Taylorsville, Miss.**

**Filed Mar. 27, 1980, Ser. No. 134,694**
**Int. Cl.³ E04B *2/00***
**U.S. Cl. 52—199** **8 Claims**



1. In a roof ventilating louver comprising a base comprised of a rectangular mounting panel having central rectangular opening therein and a four-sided collar rising from the periphery of said opening and a cover mounted upon said base in spaced relation to said collar, said cover comprising a flat rectangular top covering and extending beyond said aperture and a four-sided skirt flange depending from the periphery of said top part way to said mounting panel, and means for securing said cover to said base, the improvement wherein one side of said collar is formed to slope inwardly and the corresponding side of said skirt flange is similarly inclined and engages said sloping side of said collar to form a substantially continuous sloping surface from said base mounting panel to said top of said cover, and means for properly orienting said cover with respect to said base when assembling said louver, said orienting means comprising a pair of laterally spaced pilot holes in the upper portion of said sloping side of said collar and a pair of pilot posts extending downwardly from the lower portion of said inclined side of said skirt flange at locations coaxial with said pilot holes in the assembled louver.

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**4,297,819**

## REINFORCED MOLDED RESIN POOL WALL

**George F. Arp, Fairport, N.Y., assignor to Heldor Associates, Inc., Morris Township, Morris County, N.J.**

**Filed Feb. 6, 1980, Ser. No. 119,102**
**Int. Cl.³ E04H *3/16***
**U.S. Cl. 52—293** **21 Claims**

1. A pool wall formed of molded resin panels connected end to end, said panels having inward facing walls with peripheral flanges and strengthening ribs extending outward from said facing walls, said pool wall comprising:

a. longitudinal projections alternating along inner and outer edges of end flanges of said panels;

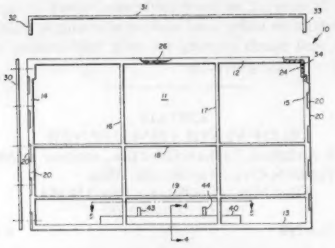
b. the alternation of said projections being reversed on opposite ends of said panels so that said projections at connected ends of said panels form mating interlocks against

vertical relative movement from panel to panel along said wall;

c. projection free spaces between said interlocked projections forming vertical channels extending up said end flanges of said panels;

d. said end flanges having holes spaced along said vertical channels;

e. horizontal channels formed along top flanges of said panels to join and extend between said vertical channels;



f. reinforcing strips extending up said vertical channels between said interlocked projections to lock said connected ends of said panels against transverse horizontal movement relative to each other;

g. said reinforcing strips also extending along said horizontal channels;

h. said reinforcing strips having holes registered with said holes in said end flanges; and

i. bolts extending through said end flanges and said reinforcing strips to connect said reinforcing strips together and secure said panels end to end.

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**4,297,820**

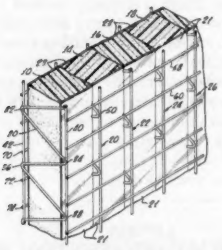
## COMPOSITE STRUCTURAL PANEL WITH MULTILAYERED REFLECTIVE CORE

**Richard F. Artzer, Riverside, Calif., assignor to Covington Brothers Technologies, Fullerton, Calif.**

**Continuation-in-part of Ser. No. 857,235, Dec. 5, 1977, Pat. No. 4,226,067. This application Oct. 29, 1979, Ser. No. 89,564**

**Int. Cl.³ E04C *2/26***

**U.S. Cl. 52—309.11** **15 Claims**



1. A structural panel comprising:

(a) a multilayered reflective core having opposite side surfaces and including:

(1) a plurality of contiguous elongated filler members, mutually contiguous ones of said filler members having opposed surfaces pressed against one another in vapor tight face-to-face contact with each other and having opposite side surfaces extending from said opposed surfaces, and

(2) a plurality of reflective vapor impervious membrane strips respectively fastened to and covering substantially the entire extent of one of said opposite side surfaces of respective ones of said filler members, mutually adjacent ones of said strips having lateral edges in edge-to-edge contact and collectively defining a substantially continuous reflective and vapor resistant layer on at least one of said side surfaces of said core;

(b) a three-dimensional supporting matrix including:

(1) a plurality of lattice structures, each being interposed between and pressed into adjacent edges of a pair of said reflective strips and a pair of said mutually opposed filler member surfaces, each of said lattice structures having opposite side portions projecting beyond said opposite side surfaces of said core, and

(2) a plurality of transverse members extending across said filler members and across said core, each of said transverse members being fixed to at least a group of said projecting opposite side portions of said lattice structures to thereby hold said lattice structures and filler members pressed together in a unitary panel configuration.

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**4,297,821**

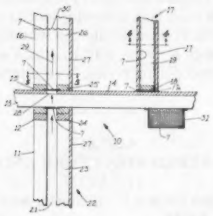
## BUILDING STRUCTURES HAVING IMPROVED FIRE RESISTANT PROPERTIES

**Lyle R. Peters, 11273 Hanover Rd., Cincinnati, Ohio 45240**

**Filed Mar. 16, 1979, Ser. No. 21,307**

**Int. Cl.³ E04B *1/94***

**U.S. Cl. 52—317** **3 Claims**



1. In a building structure of the type having structural walls formed by a pair of spaced parallel planar wall members enclosing a hollow duct-like air passageway therebetween for providing a flow of moving air therethrough to produce an insulating air envelope for said structure, the improvement in combination therewith comprising stationary firestop means positioned within said air passageway for permitting the flow of insulating air but preventing the spread of fire through said passageway, said means comprising a stationary layer of screen-like mesh fixedly secured to said wall members and extending transversely completely across said passageway, said mesh being formed of metallic strands of high purity copper having a thermal conductivity of at least about 0.9 cal-cm-sec/cm$^2$ − °C., said mesh having openings of a size permitting the free passage of insulating air but preventing the passage of flame therethrough.

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**4,297,822**

## PANELLED CEILING

**Willem Rijnders, Alblasserdam, Netherlands, assignor to Hunter Douglas International, N.V., Curacao, Netherlands Antilles**

**Filed Jun. 25, 1979, Ser. No. 51,504**

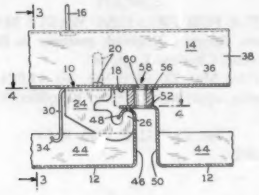
**Claims priority, application Fed. Rep. of Germany, Jul. 15, 1978, 2831203**

**Int. Cl.³ E04F *13/08***

**U.S. Cl. 52—484** **7 Claims**

1. In a suspended ceiling having a plurality of elongated supports arranged in spaced parallel relationship with each other, a plurality of holders secured to said supports, a plurality of panels, each of said panels having a pair of upwardly extending flanges at a pair of opposite edges thereof, one of

said upwardly extending flanges terminating in a support portion bent inwardly and downwardly with respect to the panel, the other of said upwardly extending flanges terminating in a support portion extending outwardly of said panel, the improvement comprising at least one of said holders having a base, means extending downwardly from said base and having at least one panel support element, the inwardly and downwardly bent support portion of a first panel engaging a panel



support element, the outwardly extending support portion of an adjacent panel engaging the inwardly and downwardly bent support portion of said first panel, a pair of spaced projections extending downwardly from said base, each panel having a second pair of upwardly extending flanges along its other opposite edges, and one of said second flanges from each of two adjacent panels extending into the space between said two projections.

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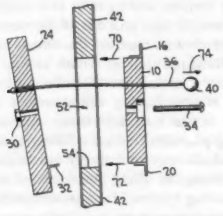
**4,297,823**

## HOLLOW WALL REPAIR DEVICE

**Carl E. Keisler, 3629 Camelot Dr., Annandale, Va. 22003**

**Filed Apr. 17, 1980, Ser. No. 141,258**
**Int. Cl.³ E02D *37/00***
**U.S. Cl. 52—514** **8 Claims**



1. A device for attachment to sheetrock or the like wall boards for repairing holes therein or attaching fixtures thereto comprising:

a surface plate having an area approximately that of the area of an opening in said sheetrock, and having an attaching bolt hole and a positioner hole extending completely therethrough;

retainer means carried by said surface plate and extending laterally outwardly therefrom;

an interior plate having an area larger than the area of said surface plate and said opening in the sheetrock, and having an attaching bolt hole and a positioner hole extending completely therethrough; and a threaded nut securely attached to said interior plate and aligned with said attaching bolt hole;

positioner guide means carried by said interior plate;

an elongated flexible member extending through said positioner holes in said surface plate and said interior plate and having anchoring means at each end thereof, so that said plates may be separated and moved along said flexible member without sliding off said member; and,

an attaching bolt for passage through the bolt holes to engage said threaded nut.

**4,297,824**

## MODULAR PREFABRICATED SEMI-PANELS TO BUILD INSIDE OR BEARING WALLS BY MEANS OF AUXILIARY CONNECTING SPACERS

**Giovanni B. Ricci, Via Palozzina, 1-f Viterbo, Italy**

**Filed Jun. 22, 1979, Ser. No. 51,457**
**Claims priority, application Italy, Nov. 12, 1978, 86007 A/78; Jan. 31, 1979, 47849 A/79**
**Int. Cl.³ E04C *1/16***
**U.S. Cl. 52—568** **1 Claim**

1. A construction member for building inner and/or bearing walls and the like, comprising at least a pair of semi-panels arranged spaced apart in opposed specular relation, said panels comprising plane bodies forming faces of a building structure, integral U-shaped pairs of connecting elements protruding from said bodies having opposed outer ends spaced a predetermined distance apart, said parts of elements lying perpendicular to said bodies and defining recesses therebetween, walls spaced from inner sides of said panels and interconnecting said outer ends of said pairs of connecting elements, said walls having opposed spaced openings, pairs of spacers extending between said bodies and into said opposed openings, opposite ends of one of said pairs of spacers solely defining the spacing between said panels while abutting against said inner sides of said panels, the other of said pairs of said spacers having opposite ends bent and engaged with inner surfaces of said interconnecting walls for solely interconnecting said panels, whereby the construction member withstands tensive and compressive stresses acting against opposite sides of said panels.

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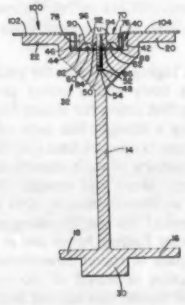
**4,297,825**

## STRUT FOR SPACE FRAMES

**George C. Harper, Jr., Coraopolis, Pa., assignor to Pittsburgh-Des Moines Corporation, Pittsburgh, Pa.**

**Filed Feb. 12, 1980, Ser. No. 120,844**
**Int. Cl.³ E04B *1/32***
**U.S. Cl. 52—729** **6 Claims**



1. A roof strut comprising:

a web;
a bottom flange connected to said web and having a first boss thereon;
a top flange having a second boss thereon, said second boss connecting said top flange to said web;
a channel defined in said top flange, said channel having a planar bottom defined by the top of said second boss;
a fastener receiving slot defined in said second boss to open into said channel;
a pair of upwardly projecting channel ridges defined on the bottom of said channel and extending for essentially the entire length of the roof strut, said channel ridges having a height substantially less than the depth of said channel;
a clamping bar sized to be loosely received in said channel, said clamping bar having a top and a bottom and including a plurality of clamping bar ridges on said bottom, said clamping bar ridges having heights greater than said channel ridges and located so that said channel ridges are located between adjacent downwardly projecting clamping bar ridges when said clamping bar is located within said channel, and fastener receiving holes defined in said clamping bar to be aligned with said fastener receiving slot so that a fastener can be used to attach said clamping bar to said second boss;
said web, bosses and flanges each having an end which is curved to correspond to the curvature of a hub of a space frame joint connector and each having an arcuate groove defined therein to receive a flange of such hub for connecting the roof strut to such hub; and
said clamping bar being adapted to attach a unitary sheet of roof covering material to the roof strut while crimping that sheet and said fastener passing through that sheet so such sheet is attached to the roof strut in a secure manner.

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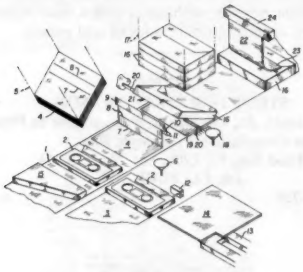
**4,297,826**

## APPARATUS FOR PACKAGING TAPE CASSETTES

**Helmuth Woertche, 70 Don Park Rd. Unit 7, Markham, Ontario, Canada (L3R 1G4)**

**Filed Aug. 23, 1979, Ser. No. 69,081**
**Int. Cl.³ B65B** *5/04, 25/00*
**U.S. Cl. 53—157** **4 Claims**



1. A cassette packaging apparatus for packing said cassettes in boxes having a body and a cover pivotally connected thereto comprising first conveyor means for moving cassettes one at a time along a straight line path of travel; first feed means for feeding inserts one at a time into the path of travel of the cassettes downstream of each cassette in the direction of travel of the cassette along said straight line path of travel; means for folding an insert about at least a portion of each cassette during travel of the cassette along said path of travel; second feed means for feeding boxes one at a time in an open position into said path of travel downstream of said folding means in the direction of travel of the cassette along said straight line path of travel, said second feed means including means for retaining the body of each said box above said path of travel with the cover thereof in an open position in said path of travel, whereby each cassette and insert combination travelling along said straight line path of travel enters a box; and means for closing each said box with a cassette and insert therein, said closing means including a spring plate extending downwardly into said path of travel, whereby the body of a box passing beneath said plate is pushed against the cover to the closed position.

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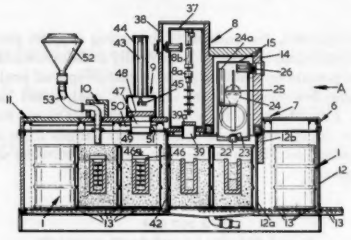
**4,297,827**

## APPARATUS FOR TREATING WASTE MATERIAL

**William Allison, Preston, England, assignor to B. & R. Engineering Limited, Chorley, England**

**Filed May 23, 1979, Ser. No. 41,971**
**Claims priority, application United Kingdom, May 23, 1978, 21289/78**
**Int. Cl.³ G21F** *7/06, 9/16*
**U.S. Cl. 53—282** **15 Claims**



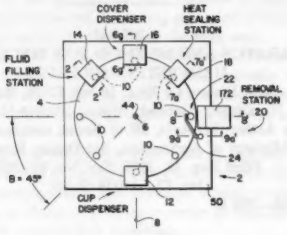
1. Apparatus for the packaging of waste material in a vessel having an outer drum, and an inner waste receiving chamber, and radiation shielding between the drum and the inner chamber, the apparatus comprising:
a vessel entry station having inlet and outlet doors for the transfer of vessels into and out of the vessel entry station;
a filling station downstream of the vessel entry station and having a filling position to which vessels are transferred from the entry station through the outlet door thereof, said filling station having filling means for introducing radioactive waste into said inner chamber, said filling means being provided within a filling means containment structure which may selectively communicate with, and be isolated from, the filling position, and said containment structure having external radiation shielding;
a mixing station having a mixing position to which a vessel is transferred from the filling position, said mixing station comprising mixing means provided in a mixing means containment structure the inside of which may selectively communicate with the mixing position whereby said mixing means may effect mixing of the contents of said inner container, said mixing means containment structure having external radiation shielding;
a capping station having a capping position to which a vessel is transferred from the mixing position, said capping station having means for introducing a protective capping material into said vessel, and said capping position having external radiation shielding;
means for providing a pressure differential in the apparatus such that the interior of the filling means containment structure is maintained at a lower pressure than the ambient pressure at the filling position and at the mixing position which are in turn at a lower pressure than the pressure of the interior of the mixing means containment structure whereby the flow of air in the apparatus will be toward the interior of the filling means containment structure; and
means for effecting transfer of a vessel from the entry station successively to the filling position, to the mixing position and to the capping position.

**4,297,828**

## AUTOMATED LIQUID CONTAINER FILLING APPARATUS

**Aaron J. Krieger, 2430 Harn Blvd, and Lawrence E. Elsie, 1573 Carroll St., both of Clearwater, Fla. 33516**

**Filed May 29, 1979, Ser. No. 43,125**
**Int. Cl.³ B65B** *3/02, 7/28*
**U.S. Cl. 53—282** **6 Claims**




**1.** An automatic container filling apparatus, comprising:

a circular table rotatably mounted on a base member for rotation about an axis perpendicular to said base member, having a plurality of holes therethrough spaced at equal angles about the circumference of the table;

drive means mounted to said base member and operatively connected to said table for periodically rotating said table through said angle;

a cup dispenser mounted on said base member at a first position over said table, having a plurality of cups stored in a storage portion and a cup delivery mechanism adjacent to said cup storage portion, which operatively is connected to said drive means, for periodically dispensing one of said plurality of cups into each of said holes in said table in synchronism with said periodic table rotation;

a filling station mounted on said base member at a second position over said table, having a fluid reservoir storing a fluid to be dispersed into said cups and a fluid delivery mechanism connected to said reservoir, which is operatively connected to said drive means, for periodically dispensing a predetermined volume of said fluid through a delivery nozzle connected therewith, into each of said cups in said holes in said table in synchronism with said periodic table rotation;

a cover dispenser mounted on said base member at a third position over said table, having a plurality of cup covers stored in a cover storage portion and a vacuum picking nozzle adjacent to said cover storage portion which is operatively connected to said drive means, for periodically picking one of said plurality of covers and placing it over the mouth of each one of said cups filled with said fluid in said holes in said table in synchronism with said periodic table rotation;

a heat sealing station mounted on said base member at a fourth position over said table, having a heating element which is operatively connected to said drive means, for periodically heating said cover placed over the mouth of each one of said cups filled with said fluid in said holes in said table to heat-seal said cover to said cup in synchronism with said periodic table rotation;

a cup removal station, including a removal ramp, mounted on said base member at a fifth position adjacent to said table;

said drive means further comprising:

a motor for providing rotary power;

a Geneva driving wheel operatively connected to said motor and rotating at a constant angular velocity;

a Geneva indexing wheel having a plurality of n radial grooves in the circumference thereof equal in number to said plurality of holes in said table, for periodically rotating said table, between rest periods, through an angle of 360/n degrees;

said cover dispenser further comprising:

a rotary cam operatively connected to said motor and rotating at said constant angular velocity, having an actuating orientation timed to occur during said rest period for said table;

a fixed vertical plate mounted on said base and located beneath said cover storage portion;

a movable plate slidably mounted to said fixed plate to assume upward and downward positions and operatively connected to said rotary cam, for undergoing vertical motion from said upward position to said downward position and then back to said upward position when said cam moves through said actuating orientation;

an upper stop pin and a lower stop pin mounted on said fixed vertical plate, along said central axis;

an upper propulsion pin and a lower propulsion pin mounted on said fixed vertical plate, respectively spaced along a second vertical axis equidistant above and below the horizontal mid-line between said upper and lower stop pins;

a nozzle rotating cam rotatably mounted on said movable plate, having three radial grooves in the circumference thereof, the first said groove operatively engaging said upper stop pin when said movable plate is in said upward position to orient said nozzle rotating cam in an upward angular position, the second said groove operatively engaging said upper propulsion pin when said movable plate is moved toward said downward position to orient said nozzle rotating cam in a horizontal angular position, the third said groove operatively engaging said lower propulsion pin when said movable plate is moved further toward said downward position to orient said nozzle rotating cam in a downward angular position where said first groove operatively engages said lower stop pin;

said vacuum picking nozzle being mounted to said nozzle rotating cam, facing upward and contacting a first one of said plurality of covers in said cover storage portion when said nozzle rotating cam is in said upward angular position;

said vacuum picking nozzle adhering to said first cover by vacuum operation and withdrawing said first cover from said cover storage portion as said movable plate slides downward from said upward position;

said vacuum picking nozzle facing downward and positioning said cover onto one of said cups in one of said table holes aligned with said cover dispenser when said movable plate reaches said downward position in response to said cam being oriented in said actuating orientation.

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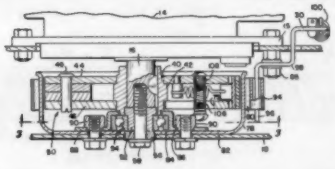
**4,297,829**

## LAWN MOWER BLADE ROTATION WARNING DEVICE

**Stephen J. Hoff, Richmond, Ind., assignor to Hoffco, Inc., Richmond, Ind.**

**Continuation-in-part of Ser. No. 114,956, Jan. 24, 1980, Pat. No. 4,152,881. This application Oct. 10, 1980, Ser. No. 195,745**
**Int. Cl.³ A01D** *75/20*
**U.S. Cl. 56—11.3** **10 Claims**



**1.** In a lawn mower having a rotary blade which is normally either driven by a motor through a releasable clutch having a driver connected to the motor or braked by a releasable brake, means for generating a warning signal in the event the clutch

and brake are both sufficiently disengaged to permit the blade to rotate under its own momentum, said means comprising a striker carried with the driven blade, and a resiliently bendable clicker arm fixedly mounted at one end to said clutch driver and having a striking portion at its free end normally held by such arm in an operative position in the path of said striker so as to be struck thereby to generate an audible signal, said arm being resiliently bendable in response to centrifugal force so as to move said striking portion to an inactive position out of the path of the striker when the clutch driver is rotated above a predetermined speed.

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**4,297,830**

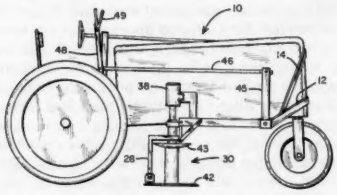
**BEAN HARVESTER**

**Donald E. Dufner, Rte. 1, Box 124, Buxton, N. Dak. 58218**

**Filed Feb. 25, 1980, Ser. No. 124,328**

**Int. Cl.³ A01D *45/22, 35/24***

**U.S. Cl. 56—13.6** **10 Claims**



**1**. An apparatus for cutting beans and other crops, for attachment to a tractor comprising

(a) an elongated drawbar shaft and means for attaching said drawbar shaft in transverse position on a tractor between the front and rear wheels thereof;

(b) a plurality of sleeve sections rotatably fitted on said drawbar shaft;

(c) a plurality of brackets respectively attached to each of said sleeve sections and extending rearwardly of said drawbar shaft;

(d) a plurality of rotatable power drive units, each respectively attached to a bracket and having a downwardly projecting power drive shaft;

(e) a plurality of spool-shaped cutters, each respectively attached to a power drive shaft and having a lower cutting edge and an upper shield edge; and

(f) means for rotatably positioning each of said plurality of sleeve sections about said drawbar shaft; thereby raising and lowering each of said plurality of cutters.

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**4,297,831**

**CUTTING BLADE FOR A ROTARY LAWNMOWER**

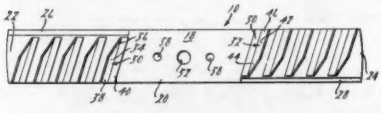
**Peter P. Pioch, Idstein, Fed. Rep. of Germany, assignor to Black & Decker Inc., Newark, Del.**

**Filed Feb. 7, 1980, Ser. No. 119,584**

**Claims priority, application European Pat. Off., Jan. 29, 1980, 80100452**

**Int. Cl.³ A01D *55/18***

**U.S. Cl. 56—295** **14 Claims**



**1**. A cutting blade for a rotary mower having a horizontally disposed blade body having cutting edges thereon and adapted for rotational movement about the vertical axis thereof when operatively connected to a rotary mower, comprising:

a plurality of generally vertically extending fins mounted on said blade body, each of said fins being spaced from said vertical axis and having a forward portion which extends from said blade body at a position closer to said vertical axis than the position at which a rearward portion thereof extends from said blade body, and each of said fins being inclined outwardly away from said vertical axis to make an acute angle with respect to the portion of said horizontally disposed blade body extending radially outwardly therefrom

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**4,297,832**

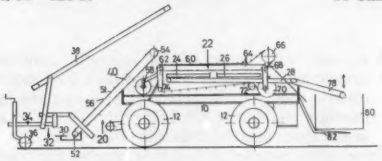
**APPARATUS AND METHOD FOR MECHANICAL HARVESTING OF FRUIT**

**Yekutiel Alper, Rishon Le Zion; Itzhak Elkin, Rehovot; Itzhak Wolf, Herzliyah; Gabriel Mihai, Ramat-Hasharon, and Aharon Antler, Tel-Aviv, all of Israel, assignors to State of Israel Ministry of Agriculture, Bet Dagan, Israel**

**Filed Dec. 28, 1979, Ser. No. 107,855**

**Int. Cl.³ A01D *46/00***

**U.S. Cl. 56—328 R** **10 Claims**



**1**. Mechanical fruit harvesting apparatus comprising:

cutter means for cutting fruit bearing portions of a tree from the trunk thereof;

separation conveyor means for engaging and vibrating said fruit bearing portions after cutting thereof so as to cause fruit to separate therefrom; and

feeding conveyor means for engaging said fruit bearing portions and bringing them into engagement with said separation conveyor means and including:

a first conveyor belt; and

a pair of cooperating second conveyor belts for engaging the upper parts of said fruit bearing portions between themselves, said first and second conveyor belts moving together in synchronous motion.

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**4,297,833**

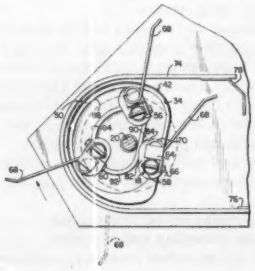
**CROP PICKUP WITH OUTBOARD CAM CONTROL**

**Melvin V. Gaeddert, Newton, Kans., assignor to Hesston Corporation, Hesston, Kans.**

**Filed Oct. 11, 1979, Ser. No. 83,625**

**Int. Cl.³ A01D *43/02***

**U.S. Cl. 56—364** **6 Claims**



**1**. A crop pickup device comprising:

a pair of laterally spaced, stationary sidewalls;

a reel adapted for rotation about an axis extending between said sidewalls and including crop-engaging structure projecting transversely outwardly of said axis for engaging crop material during rotation of the reel and for feeding the same along a path of delivery generally transverse to said axis of rotation of the reel,

said structure being mounted for rocking movement to-and-fro in a prescribed pattern with respect to the direction of rotation of the reel during said rotation to improve the feeding action thereof, and being provided with an operating rocker adjacent one end of the reel; and

a stationary cam track mounted outboard of the sidewall adjacent said one end of the reel and operably receiving said rocker for effecting said rocking movement of the structure as the rocker is carried with the reel about said axis,

said one sidewall being provided with an opening through which said rocker and said cam track maintain their operative interengagement and through which access to said structure is afforded from the exterior of said one sidewall when said cam track is removed.

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**4,297,834**

## YARN BRAKE FOR A TEXTILE YARN PROCESSING MACHINE

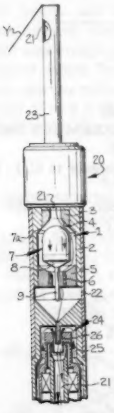
**Gustav Franzen, Willich, Fed. Rep. of Germany, assignor to Palitex Project Company GmbH, Krefeld, Fed. Rep. of Germany**

**Filed Jan. 29, 1980, Ser. No. 116,398**

**Claims priority, application Fed. Rep. of Germany, Jan. 29, 1979, 2903337**

**Int. Cl.³ D01H** *7/86, 13/10, 15/00*

**U.S. Cl. 57—58.86** **6 Claims**




**1**. A yarn brake for applying tension to a yarn and comprising a substantially tubular brake housing having a passageway therethrough adapted for receiving a yarn moving in a predetermined direction, a stationary braking surface provided in said housing, a stationary permanent magnet positioned in said housing and longitudinally spaced from said braking surface in the direction of movement of the yarn, and a braking body positioned for longitudinal movement within said housing between said braking surface and said stationary magnet, said braking body comprising a permanent magnet having a magnetic polarization oriented in repelling relation to said stationary magnet for biasing the braking body toward and into engagement with said braking surface to apply tension to a yarn passing therebetween while allowing reliable separation of said braking body and said braking surface under the influence of a displacing force greater than the repelling force of said magnets.

**6**. In a spindle of a textile yarn processing machine having an axial yarn passageway extending therethrough and including a threading mechanism for creating a pneumatic flow in said yarn passageway to automatically thread a yarn therethrough during a thread-up operation, the combination therewith of an improved yarn brake for applying tension to the yarn passing through the yarn passageway during normal operation and constructed so as to readily accommodate the passage of enlarged portions in the yarn and to facilitate automatic threading of the yarn through said yarn passageway during a thread-up operation, said yarn brake comprising a substantially tubular brake housing mounted in said spindle and adapted for receiving a yarn therethrough in a predetermined direction, a stationary braking surface provided in said housing, a stationary permanent magnet positioned in said housing and longitudinally spaced from said braking surface in the direction of movement of the yarn, and a braking body positioned for longitudinal movement within said housing between said braking surface and said stationary magnet, said braking body comprising a permanent magnet having a magnetic polarization oriented in repelling relation to said stationary magnet for biasing the braking body toward and into engagement with the braking surface during normal operation to apply tension to a yarn passing therebetween, and wherein the two magnets have a repelling force which is smaller than the pneumatic force exerted on the braking body by said threading mechanism so that the brake is automatically released when a yarn is pneumatically threaded through the passageway and automatically returns to the braking position when the thread-up operation is completed.

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**4,297,835**

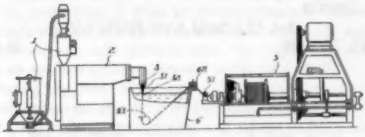
## SYNTHETIC STRINGS

**Mituo Shimizu, 3-32 Kayabacho Chikusaku, Nagoya City, Japan**

**Filed Nov. 23, 1979, Ser. No. 96,685**

**Int. Cl.³ D02G** *3/36*

**U.S. Cl. 57—251** **12 Claims**



**1**. A string comprising:

a central filament;

at least one filament twisted around said central filament defining at least one continuous regularly disposed spiral bore therebetween; and

means for fusing said at least one filament to said central filament such that the cross-sectional area of said at least one filament and of said central filament remain circular and such that said at least one continuous regularly disposed spiral bore is maintained whereby a solidly integrated monofilament string is formed.

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**4,297,836**

## GUARD FOR YARN TEXTURING MACHINE

**James R. Lilly, Stoneville, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.**

**Filed Jan. 28, 1980, Ser. No. 115,662**

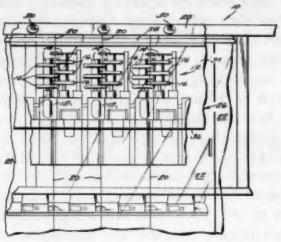
**Int. Cl.³ D01H** *13/26*

**U.S. Cl. 57—291** **3 Claims**

**1**. In a machine for texturing textile yarns provided at the front with a bank of pairs of upright spindles having axially spaced ceramic discs stacked thereon with the discs on one spindle of a pair intermeshing with those on the other spindle

of the pair; the combination of a shield to prevent an operator from being struck in critical areas by flying pieces in the event a disc shatters during operation of the machine, comprising:

a transparent sheet of tough strong material disposed in front of and spaced from said bank, the area and location of said shield being such that any pieces of the ceramic discs flying forwardly in the event of disintegration of a disc



will strike said shield, the spacing between said sheet and bank being sufficient to permit necessary manipulation in the spindle area by an operator standing in front of the machine, and the lower edge of said shield being high enough to permit an operator to reach thereunder to perform said manipulations; and

means supporting said shield on the machine.

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**4,297,837**

## METHOD AND APPARATUS FOR PRODUCING SPUN YARN CHARACTERISTICS IN SYNTHETIC MULTIFILAMENT YARNS

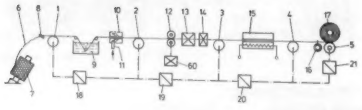
**Karl Bauer, Remscheid, and Eberhard Krenzer, Ennepetal-Rüggeberg, both of Fed. Rep. of Germany, assignors to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Remscheid, Fed. Rep. of Germany**

**Filed Dec. 5, 1979, Ser. No. 100,357**

**Claims priority, application Fed. Rep. of Germany, Dec. 18, 1978, 2854578**

**Int. Cl.³ D02J *3/02*; D02G *1/16***

**U.S. Cl. 57—350** **36 Claims**



1. A method of producing a synthetic multifilament yarn having appearance, bulk and hand characteristics of conventional spun yarns of staple fibers while retaining strength characteristics of continuous filament yarns, said method comprising the steps of:

feeding the continuous multifilament yarn through a high velocity air jet texturing device while forming loops, bows, coils and the like in the filaments defining the surface of the yarn,

feeding the textured yarn from the air jet texturing device through a false twist device while false twisting the yarn, and

parting at least some of the filaments having loops, bows, coils and the like therein by contacting such filaments with a filament parting device while guiding said yarn past the filament parting device along a predetermined path of travel which limits contact between the filament parting device and the yarn solely to the surface filaments to maintain the interior filaments of the yarn substantially intact to form free filament or fiber ends projecting from a strong substantially uninterrupted filament core.

**4,297,838**

## ELECTRONIC TIMEPIECE

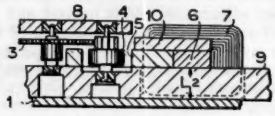
**Minoru Watanabe; Kazunari Kume, both of Tokorozawa; Hideshi Ohno, Sayama, and Munetaka Tamaru, Tokyo, all of Japan, assignors to Citizen Watch Co. Ltd., Tokyo, Japan**

**Continuation of Ser. No. 789,036, Apr. 20, 1977, abandoned. This application Dec. 8, 1978, Ser. No. 967,715**

**Claims priority, application Japan, Apr. 27, 1976, 51-48285; Aug. 20, 1976, 51-111435**

**Int. Cl.² G04C *3/00***

**U.S. Cl. 368—76** **3 Claims**



1. An electronic timepiece comprising a step-motor used as an electro-mechanical transducer and including a coil having a coil winding core, stator and rotor; a reduction gear train for reducing rotation of said rotor of said step-motor; a bearing for rotatably supporting at least one gear of said reduction gear train; a gear train supporting plate; and a substrate for supporting all of the above mentioned parts of the timepiece; the improvement comprising a portion of said coil winding core and said stator located in the same plane and adjacent said substrate and a second portion of said coil winding core integral with said first portion and extending on the side of said stator opposite said substrate to form a magnetic connection means between said core and a side of said stator opposite said substrate.

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**4,297,839**

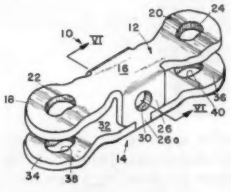
## CHAIN LINK AND CHAIN ASSEMBLY INCLUDING SAME

**Gerald W. Gurney, Ada, Mich., assignor to C. L. Frost & Son, Inc., Grand Rapids, Mich.**

**Filed Oct. 1, 1979, Ser. No. 80,655**

**Int. Cl.³ F16G *13/18***

**U.S. Cl. 59—85** **28 Claims**

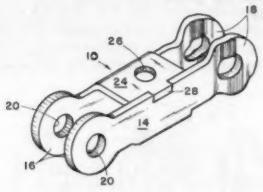


1. A chain link assembly comprising first and second aligned, rigid link members, each link member being elongated and including opposed ends, each end having an opening for receiving fastening means for attaching said assembly in a chain, and rigid bridge means extending between said link members at at least two spaced positions intermediate said opposed ends and said openings of said link members for spacing and supporting said link members when said link members are fitted together to form said assembly; said bridge means including support means for supporting a chain support wheel support.

## 4,297,840
## CHAIN LINK AND CHAIN ASSEMBLY INCLUDING SAME

Gerald W. Gurney, Ada, Mich., and William E. Lanham, Jr., Stone Mountain, Ga., assignors to C. L. Frost & Son, Inc., Grand Rapids, Mich.

Filed Oct. 1, 1979, Ser. No. 80,656
Int. Cl.³ F16G 13/18
U.S. Cl. 59—85 15 Claims

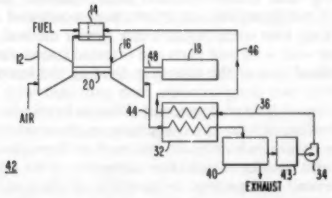



1. A chain link assembly comprising first and second identical, elongated, rigid link members, each link member having a longitudinal portion and a transverse bridge portion, said longitudinal portion having first and second opposed ends with an opening in each end for receiving fastener means for attaching said assembly in a chain, one of said opposed ends of each of said link members including a curved surface facing outwardly of said assembly, the other of said opposed ends of each link member being generally planar; said opening in said one end in each of said link members being elongated in the direction of elongation of said link member, said bridge portion being intermediate said openings and opposed ends and adapted to engage, support and index each opposite longitudinal portion such that when said link members are fitted together and receive fastener means, said link members form a chain link assembly with spaced, longitudinally extending sides supported through said bridge portions; said bridge portions each including support means for supporting a conveyor support wheel support; said one end of each of said link members being at the same end of said assembly to allow articulation of said assembly at said end when connected in a chain.

## 4,297,841
## CONTROL SYSTEM FOR CHENG DUAL-FLUID CYCLE ENGINE SYSTEM

Dah Y. Cheng, Los Altos Hills, Calif., assignor to International Power Technology, Inc., Sunnyvale, Calif.

Filed Jul. 23, 1979, Ser. No. 59,591
The portion of the term of this patent subsequent to Dec. 12, 1995, has been disclaimed.
Int. Cl.³ F02C 7/00, 7/10
U.S. Cl. 60—39.3 7 Claims



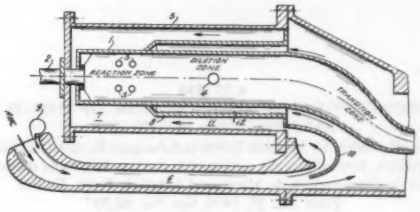

1. A control system for a dual-fluid, Brayton/Rankine cycle engine comprising control means for following a control path defined by the locus of peak efficiency points at reduced loads, where the control path results in a declining turbine inlet temperature as the load decreases; and wherein said control means comprises:

(a) a first control system for controlling the Brayton cycle part of the dual-fluid cycle engine;
(b) a second control system for controlling the Rankine part of the dual-fluid cycle engine; and
(c) memory means for setting the desired operating points of said first and second control systems, where the memory means contains predetermined settings for each of the two control systems for all load conditions, and wherein said predetermined settings comprise at least fuel flow rates and water flow rates.

## 4,297,842
## NOX SUPPRESSANT STATIONARY GAS TURBINE COMBUSTOR

Bruce W. Gerhold, Rexford, and Colin Wilkes, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 21, 1980, Ser. No. 113,638
Int. Cl.³ F02C 3/30; F23R 3/54
U.S. Cl. 60—39.06 5 Claims




1. In a stationary gas turbine combustor comprising a reaction zone, a dilution zone, a combustion liner enclosing said reaction and dilution zones, means to introduce air into said reaction zone through said liner, means to introduce air into said dilution zone through said liner, a fuel nozzle for introducing fuel into said reaction zone through said liner and air flow means for conveying air from an air compressor to said means for introducing air into said reaction zone and said means to introduce air into said dilution zone, the improvement comprising an air flow splitter disposed within said air flow means for dividing the flow of air into a first path communicating with said means to introduce air into said reaction zone and a second path communicating with said means to introduce air into said dilution zone and, means for injecting NOx suppressants into said air flow means, said injecting means disposed adjacent said air compressor and relative to said air flow means to concentrate said NOx suppressants in said first path by utilizing the radially stratified compressor air flow.

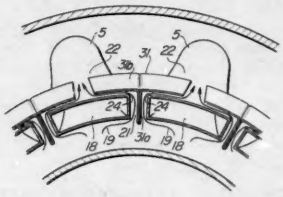
## 4,297,843
## COMBUSTOR OF GAS TURBINE WITH FEATURES FOR VIBRATION REDUCTION AND INCREASED COOLING

Isao Sato; Fumio Kato; Yoshihiro Uchiyama; Nobuyuki Iizuka, and Tsuneyuki Hata, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 12, 1979, Ser. No. 84,438
Claims priority, application Japan, Oct. 16, 1978, 53-126192
Int. Cl.³ F02C 7/18
U.S. Cl. 60—39.32 7 Claims

1. A combustor of a gas turbine having a plurality of combustor liners, a plurality of transition pieces connected to respective liners and adapted to rectify the flow of combustion gas coming from said liners, and a plurality of outer casings surrounding respective combinations of said liners and said transition pieces, comprising a guide plate having a radial portion disposed in each gap formed between each pair of adjacent transition pieces, said guide plate being adapted to rectify the air flowing through said gap, each guide plate

having circumferential members that overlie the transition pieces and are attached to the radial portion of the guide plate,



and said circumferential members form a gap between the adjacent circumferential members for exit of the cooling air.

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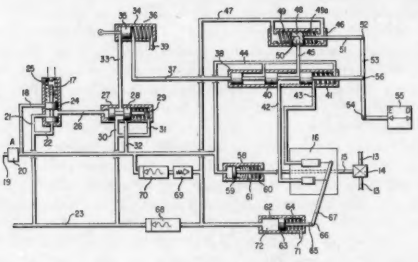
**4,297,844**

## DEVICE FOR HYDRAULIC CONTROL OF THRUST REVERSAL FOR JET ENGINE

**Yves R. Halin, Le Mee sur Seine, and Jacques R. A. LeLandais, Melun, both of France, assignors to Societe Nationale d'etude et de Construction de Moteurs d'Aviation, Paris, France**

**Filed Jul. 25, 1979, Ser. No. 60,597**
**Claims priority, application France, Jul. 25, 1978, 78 21896**
**Int. Cl.³ F02K *1/72;* F16D *31/02***
**U.S. Cl. 60—226 A** **10 Claims**



1. A device for hydraulic control of thrust reversal for jet engines in which thrust reversal units which can be positioned in either a deployed or concealed position are activated by jacks which are connected through flexible units to a rotary hydraulic engine, fed under constant pressure by a hydraulic circuit comprising:

means for slowing the speed of the reversal units upon approaching said deployed or concealed position; and

means for directly subjecting the capacity of the engine to back pressure of the engine,

wherein said means for directly subjecting the capacity of the engine to back pressure of the engine is not sensitive to the engine feed pressure and comprises a control jack having an output whose position determines engine capacity, means for communicating said output of said control jack only with a source of engine back pressure, and spring means in said control jack and adapted to oppose said back pressure, and wherein the direction of opposition of said spring means moves said output towards increased engine capacity.

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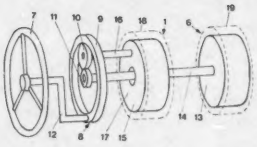
**4,297,845**

## METERING TYPE HYDROSTATIC STEERING UNIT WITH PLANETARY GEARING TYPE INPUT AND FEEDBACK MEANS

**Erik Kyster, Augustenborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark**

**Filed Nov. 26, 1979, Ser. No. 97,349**
**Claims priority, application Fed. Rep. of Germany, Dec. 13, 1978, 2853704**
**Int. Cl.³ B62D *5/08;* F15B *13/04***
**U.S. Cl. 60—384** **1 Claim**



1. A hydrostatic steering assembly, comprising, a bidirectional servomotor, a control valve unit having inlet and outlet ports and two working ports connected to said servomotor, pump and tank means connected to said inlet and outlet ports, said control valve unit having a fixed housing member and an annularly shaped valve member rotatable relative thereto in opposite directions with respect to a neutral position, epicyclic gearing having a ring gear and a sun gear with planetary gear means therebetween, steering shaft means connected to said ring gear, bidirectional metering motor means having output shaft means connected to said sun gear and being operated by fluid pressure from said control valve unit for supplying metered quantities of pressurized fluid to selected sides of said servomotor through said working ports, said metering motor output shaft means extending through said valve member, and said planetary gear means being connected to said valve member for moving said valve member in opposite selected directions away from and towards said neutral position responsive to actuation by said steering shaft means.

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**4,297,846**

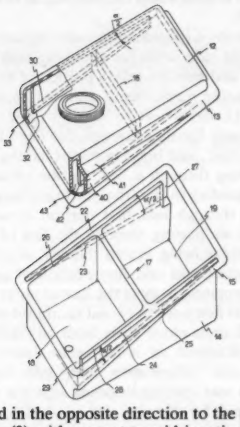
## TWO-COMPARTMENTS FLUID RESERVOIR

**Leonardo Cadeddu, Crema, Italy, assignor to Benditalia S.p.A., Crema, Italy**

**Filed Mar. 14, 1980, Ser. No. 130,326**
**Int. Cl.³ B65D *1/24***
**U.S. Cl. 60—585** **9 Claims**

1. Two-compartment reservoir for liquid, particularly for supplying dual master-cylinders with hydraulic fluid, composed of two complementary parts superposed and assembled by sticking, heat soldering, or other similar method, a median partition solid with said parts and oriented transversally to the longitudinal axis of the reservoir dividing the interior of the latter into two compartments each provided with an outlet orifice, one at least of these compartments having in addition a filling orifice, and the two compartments communicating via a transfer channel which opens into each of them characterized in that said transfer channel runs along one of the side walls of the reservoir and parallel to the plane of the level of liquid contained in this reservoir, this transfer channel itself being composed of two superposed complementary parts, namely a lower part in the general shape of a gutter and an upper part, solid respectively with the lower part and upper part of the reservoir, these parts together defining a closed contour and their junction plane coinciding with that of the constituent parts of the reservoir, and in which, to allow construction with

the same constituent elements of two types of reservoir usable for two different inclinations of the associated master-cylinder, and particularly at a zero inclination and at an inclination defined by an angle ($\alpha$) with respect to the horizontal, the plane of junction of the two parts (**12, 14**) of the reservoir forms with the bottom of each of them an angle ($\alpha/2$) equal to half the angle of inclination defined above, that the lower part (**14**) of the reservoir bears a lower transfer-channel part along each of its two side walls, the bottom (**23**) of one of these channel parts (**22**) originating at the level of the junction plane and at the lower end of a side wall and being inclined at an angle ($\alpha/2$) with respect to said junction plane, the bottom (**25**) of the other channel part (**24**) also originating at the level of the junction plane but at the higher end of the other side wall and



being inclined in the opposite direction to the preceding at the same angle ($\alpha/2$) with respect to said junction plane, and that the upper part (**12**) of the reservoir bears along one of its two side walls an upper transfer-channel part whose depth extends along the whole wall, said upper part of the transfer channel cooperating with one or other of said lower parts according to the relative position of the two constituent parts of the reservoir so as to form a transfer channel of closed section opening at its ends, and along the other side wall a second channel part, less deep, whose roof originates at the level of the junction plane and is inclined with respect to this last at an angle greater than $\alpha/2$ the said channel part cooperating with the second lower part to form a channel blind at one end and capable, at the other end, of allowing air to escape on filling with fluid.

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**4,297,847**

## CONVERSION OF GEOTHERMAL ENERGY FROM SUBTERRANEAN CAVITIES

**Carl C. Clayton, Corpus Christi, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.**

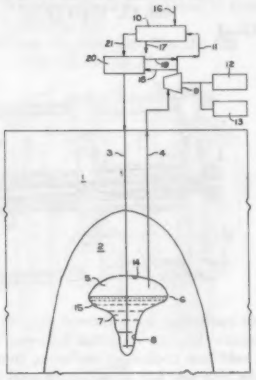
**Filed Aug. 30, 1979, Ser. No. 71,337**
**Int. Cl.³ F03G *7/00***
**U.S. Cl. 60—641.3** **12 Claims**

1. A method of recovering geothermal energy, which comprises:

a. introducing immiscible liquid hydrocarbon working fluid below the surface of a brine solution maintained in a subterranean cavity produced by the solution mining of salt within a salt dome that is in heat exchange relationship with a geothermal formation, said hydrocarbon working fluid being vaporizable at the temperature of the brine solution;

b. collecting vaporized working fluid in a vapor space that is directly above the brine solution and within the subterranean cavity until the working fluid vapor develops pressure sufficient to mobilize vaporized working fluid to the earth's surface, said vapor space being sufficiently large to separate brine solution entrained in vaporized working fluid as the vaporized fluid passes through the vapor space;

c. removing pressurized working fluid vapor from the cavity to the earth's surface; and



d. converting the pressure-volume energy of the pressurized working fluid vapor to another form of energy by isentropic expansion of the working fluid vapor.

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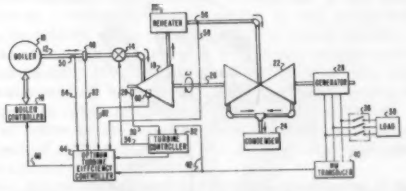
**4,297,848**

## METHOD OF OPTIMIZING THE EFFICIENCY OF A STEAM TURBINE POWER PLANT

**George J. Silvestri, Jr., Upper Chichester, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Nov. 27, 1979, Ser. No. 97,770**
**Int. Cl.³ F01K *13/02***
**U.S. Cl. 60—660** **12 Claims**




1. A method of improving the operational efficiency of a steam turbine power plant at a desired power demand output value comprising the steps of:

measuring a predetermined turbine parameter at said desired power demand output value of said power plant, said predetermined turbine parameter being representative of the steam flow through said steam turbine during the operation thereof;

compensating said measured values of said predetermined turbine parameter in accordance with varying thermodynamic conditions of said steam turbine during the operation thereof at said desired power demand output value; and

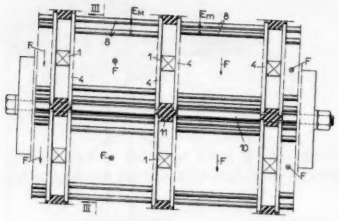
governing an adjustment of the steam pressure at the throttle of said steam turbine at said desired power demand output level based on selected compensated measured values of said turbine parameter to improve the operational efficiency of said steam turbine.

**4,297,849**

## HEAT EXCHANGERS FOR THERMO-ELECTRIC INSTALLATIONS COMPRISING THERMO-ELEMENTS

**Jean Buffet, Paris, France, assignor to Air Industrie, Courbevoie, France**

**Filed Jun. 22, 1979, Ser. No. 51,132**
**Int. Cl.³ F25B *21/02***
**U.S. Cl. 62—3** **18 Claims**



**1.** A heat exchanger for a thermo-electric installation comprising thermo-elements mounted between a hot wall and a cold wall, said heat exchanger including two base plates thermally contacting said hot or said cold wall and a plurality of heat exchange surfaces extending between said two base plates, each of said heat exchange surfaces being constituted by an array of homogeneous one-piece bars, said bars being firstly disposed and spaced apart in a first plurality of planes perpendicular to the direction of fluid flow and secondly disposed and spaced apart in a second plurality of planes parallel to the direction of fluid flow.

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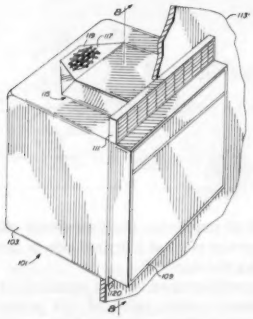
**4,297,850**

## WALL MOUNTED THERMOELECTRIC REFRIGERATOR

**Kingstone L. H. Reed, Barrie, Canada, assignor to Koolatron Industries, Inc., Barrie, Canada**

**Filed Dec. 26, 1979, Ser. No. 106,940**
**Int. Cl.³ F25B *21/02*; F25D *23/12***
**U.S. Cl. 62—3** **4 Claims**



**1.** A thermoelectric refrigeration unit for permanent installation in a recreational vehicle, boat, cabin or the like, said thermoelectric refrigeration unit including an insulating front-opening door, an insulating storage compartment which is sealed when the front-opening door is closed, the storage compartment being bonded by bottom, a top, and two side walls, said thermoelectric refrigeration unit comprising in combination:

a. a thermoelectric unit including an internal heat exchanger disposed on the inner surface of the storage compartment, a thermally conductive block of material extending through an opening in one of said top and said side walls and in intimate thermal contact with said internal heat exchanger, a solid state thermoelectric device in intimate thermal contact with said thermally conductive block, and an external heat exchanger disposed on the outer surface of said insulating wall and in intimate thermal contact with said solid state thermelectric device;

b. an electric fan unit for blowing relatively cool air from outside of said thermoelectric refrigeration unit between fins of said external heat exchanger;

c. front grill means attached to a front edge of said one of said top and said side walls for allowing the relatively cool outside air to be drawn by said fan unit into an installation region into which the thermoelectric refrigeration unit is installed and for allowing air blown between the fins of said external heat exchanger to pass outside of the installation region in which said thermoelectric refrigeration unit is installed;

d. housing means disposed on the outer surface of one of said top and said side walls for enclosing said external heat exchanger and said fan unit, a portion of an inner surface of said housing means being disposed immediately adjacent to said external heat exchanger to efficiently guide air blown by said fan unit through the fins of said external heat exchanger, said housing means having a front opening extending through a first portion of said front grill means for guiding the air from the fins of said external heat exchanger through said first portion of said front grill means, the air passing through the fins of said external heat exchanger being heated thereby, said fan unit, said housing means, and said first portion of said front grill means cooperating to eject the heated air at high velocity through said first portion of said front grill means to cause said heated air to move away from said front grill means so that said heated air is not recirculated through said thermoelectric refrigeration unit, said housing means including a rear opening disposed adjacent to a fan blade of said fan unit for allowing said relatively cool outside air to be drawn into said housing means by said fan unit, said relatively cool outside air being drawn into said installation region through a second portion of said front grill means, said housing means including a top that is substantially parallel to the top of the storage compartment, two sides, and a substantially sloping rear wall, said fan blade of said fan unit rotating in a plane that is substantially parallel to said sloping rear wall, the width of said housing means being substantially greater than the height of said housing means.

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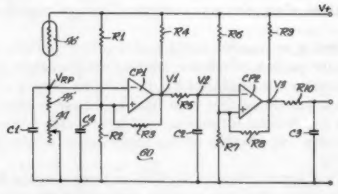
**4,297,851**

## TEMPERATURE SENSING CIRCUIT WITH HIGH NOISE IMMUNITY

**Stephen W. Paddock, Evansville, and Andrew T. Tershak, Centre Township, Vanderburgh County, both of Ind., assignors to Whirlpool Corporation, Benton Harbor, Mich.**

**Filed Aug. 20, 1979, Ser. No. 68,473**
**Int. Cl.³ F25B *49/00*; G01K *3/00***
**U.S. Cl. 62—126** **9 Claims**



**1.** In a refrigerator system having refrigeration apparatus for cooling a refrigerated compartment, a temperature sensing

circuit for developing a digital signal representative of a temperature above or below a set point, comprising:

an analog temperature sensing device for developing a sensing signal dependent on temperature in said refrigerated compartment;

a first comparison stage coupled to said analog temperature sensing device for developing a first signal to indicate whether the sensing signal is above or below a predetermined first level, the first comparison stage having little or no hysteresis in its response; and

a second comparison stage having an input responsive to said first signal for developing said digital signal to indicate whether the temperature is above or below said set point, the second comparison stage having substantial hysteresis in its response.

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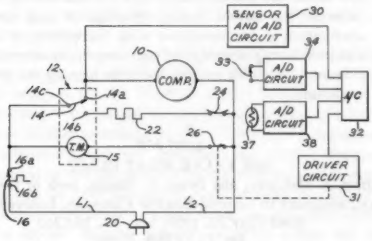
**4,297,852**

**REFRIGERATOR DEFROST CONTROL WITH CONTROL OF TIME INTERVAL BETWEEN DEFROST CYCLES**

**Robert B. Brooks, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.**

**Filed Jul. 17, 1980, Ser. No. 169,570**
**Int. Cl.³ F25D *21/06***
**U.S. Cl. 62—153** **3 Claims**




1. In a self-defrosting refrigerator having at least one food storage compartment with an access door thereto and a refrigerant system including a motor-operated compressor, an evaporator for cooling the food storage compartments, thermostatic means for turning the compressor on and off to maintain a desired temperature in the food compartments, and defrost heater means for periodically removing frost build-up from the evaporator, the combination comprising:

timer operated switch means responsive to the thermostatic means (a) during the compressor-on periods to establish a minimum compressor run time between defrost cycles and (b) during the defrost cycle to activate the defrost heater means for a predetermined maximum defrost period;

means for accumulating total compressor run time during the entire elapsed time between defrost cycles;

a door open sensor;

means responsive to the door open sensor for accumulating the amount of time the door is open at least up to a predetermined amount of door-open time;

decision means for providing a first control effect representative of when the accumulation of compressor run time reaches the minimum run time of the timer means and a second control effect representative of when the predetermined amount of accumulated door-open time is reached;

and timer control switch means coupled in electrical circuit with the timer means and effective in response to the decision means to interrupt operation of the timer means in response to the sole presence of the first control effect, and to initiate or continue operation of the timer means in response to the simultaneous presence of both the first and second control effects;

whereby elapsed time between defrost cycles is extended beyond a minimum compressor run time during relatively light usage of the refrigerator wherein usage is measured by door open time.

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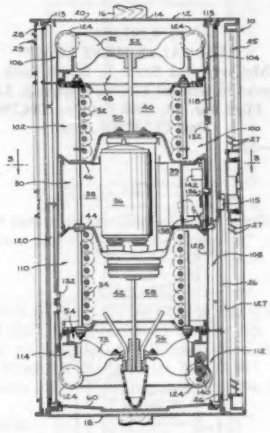
**4,297,853**

**RETRACTABLE HANDLE FOR AIR VALVE HEAT PUMP**

**Diane M. Dehli, Jeffersonville, Ind., assignor to General Electric Company, Louisville, Ky.**

**Filed May 15, 1980, Ser. No. 150,102**
**Int. Cl.³ F25B *29/00***
**U.S. Cl. 62—325** **3 Claims**



1. An air conditioning apparatus for conditioning air in an enclosure having a wall opening comprising:

a housing having openings on opposite sides thereof adapted to be positioned in said wall opening with the opening on one side of said housing facing the outdoors and the opening on the other side of said housing facing said enclosure;

a central chamber defined by spaced partition means dividing said housing into an upper evaporator compartment and a lower condenser compartment;

a refrigerating system including a condenser in said condenser compartment, an evaporator in said evaporator compartment and a compressor in said central chamber;

a fan shroud partition means in each of said compartments substantially dividing said compartments into inlet and outlet sections, each of said sections having an opening in both the indoor and outdoor facing side of said housing; a fan within each of said shrouds for circulating air through each of said compartments in a direction from said inlet section to said outlet section;

a first damper slidably arranged for vertical movement in the indoor facing side of said housing being associated with the indoor facing openings of said compartments; said damper is dimensioned to cover the openings of one of said compartments, a second damper slidably arranged for vertical movement in the outdoor facing side of said housing being associated with the outdoor facing opening of said compartments, said damper dimensioned to cover the opening of the other of said compartments;

retractable hand operable means on said indoor damper for moving said indoor damper to a selected one of said compartment openings

damper connecting means associated with both of said dampers so that movement of said indoor damper arranged in the indoor facing openings to a position over one of said compartment openings causes movement of said outdoor damper on the outdoor facing openings to a position over the other of said compartment openings;

a handle having a mounting portion and a grip portion, a bracket member having flange portions secured to the

outer wall of said indoor damper and a sleeve portion extending outwardly from said flange portion being spaced from said front wall of said indoor damper a distance sufficient to slidably receive the mounting portion of said handle so that said grip portion of said handle is slidable relative to said damper by a user of said apparatus a distance beyond the outer dimension of said housing side walls to an extended position for allowing said user to move said damper vertically through said connecting means over selected ones of their cooperating compartment openings.

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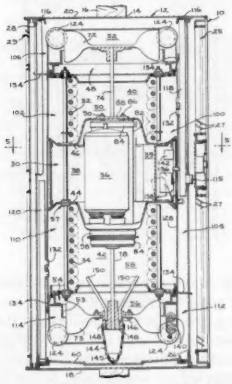
**4,297,854**
**AIR VALVE HEAT PUMP**
**William J. McCarty, and Bruce L. Ruark, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.**
**Filed Apr. 28, 1980, Ser. No. 144,796**
**Int. Cl.[3] F25B *29/00***
**U.S. Cl. 62—325** **22 Claims**



**1**. An air conditioning apparatus for conditioning air in an enclosure having a wall opening comprising:

a housing having openings on opposite sides thereof adapted to be positioned in said wall opening with the opening on one side of said housing facing the outdoors and the opening on the other side of said housing facing said enclosure;

a central chamber defined by spaced partition means dividing said housing into an evaporator compartment and a condenser compartment;

a refrigerating system including a condenser, an evaporator and a compressor;

a fan shroud partition means in each of said compartments substantially dividing said compartments into inlet and outlet sections, each of said sections having an opening in both the indoor and outdoor facing side of said housing; a fan within each of said shrouds for circulating air through each of said compartments in a direction from said inlet section to said outlet section;

said evaporator and said condenser being of the spine fin type, consisting of one continuous tube member wound spirally so that each heat exchanger is arranged in circular fashion and positioned generally around the fan in the shroud partition within their respective compartments,

means for connecting said partition means in spaced relationship to form a refrigeration system chassis adapted to be received in said housing, said connecting means including members being dimensioned so that said spirally wound evaporator being arranged in said evaporator compartment between the upper central compartment partition means and said evaporator compartment fan shroud partition means is compressed and securely held therebetween and also said connecting members being dimensioned so that said condenser being arranged in said condenser compartment between the lower central compartment partition and said condenser compartment fan shroud partition means is compressed and securely held therebetween and said compressor being arranged in said central chamber to define a system chassis arranged in said housing,

a fan motor mounted in one of said central chamber partitions having a shaft extending into said evaporator compartment for driving one of said fans, and a second fan motor mounted in the other of said central chamber partitions having a shaft extending into said condenser compartment for driving the other of said fans;

a first damper slidably arranged in the indoor facing side of said housing being associated with the indoor facing openings of said compartments; said damper is dimensioned to cover the openings of one of said compartments, a second damper slidably arranged in the outdoor facing side of said housing being associated with the outdoor facing opening of said compartments, said damper dimensioned to cover the opening of the other of said compartments; and

means for selectively positioning said dampers to a first cooling position wherein the indoor facing openings of said evaporator compartment communicate with the enclosure and the outdoor facing openings of said condenser compartment communicate with said outdoors for cooling the air in said enclosure and to a second heating position wherein the indoor facing openings of said condenser compartment communicate with the enclosure and the outdoor facing openings of said evaporator compartment communicate with said outdoors for heating the air in said enclosure.

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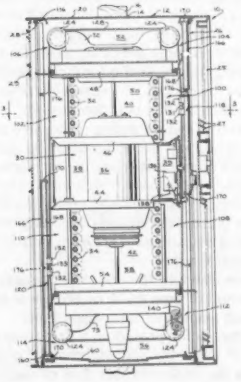
**4,297,855**
**AIR VALVE HEAT PUMP**
**William J. McCarty, and Bruce L. Ruark, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.**
**Filed May 21, 1980, Ser. No. 152,263**
**Int. Cl.[3] F25B *29/00***
**U.S. Cl. 62—325** **8 Claims**



**1**. An air conditioning apparatus for conditioning air in an enclosure having a wall opening comprising:

a housing having openings on opposite sides thereof adapted to be positioned in said wall opening with the opening on one side of said housing facing the outdoors and the opening on the other side of said housing facing said enclosure;

a central chamber defined by spaced partition means dividing said housing into an evaporator compartment and a condenser compartment;

a refrigerating system including a condenser in said con-

denser compartment, an evaporator in said evaporator compartment and a compressor in said central chamber;

a fan shroud partition means in each of said compartments substantially dividing said compartments into inlet and outlet sections, each of said sections having an opening in both the indoor and outdoor facing side of said housing; a fan within each of said shrouds for circulating air through each of said compartments in a direction from said inlet section to said outlet section;

a first damper slidably arranged in the indoor facing side of said housing being associated with the indoor facing openings of said compartments; said damper is dimensioned to cover the inlet and outlet section openings of one of said compartments, a second damper slidably arranged in the outdoor facing side of said housing being associated with the outdoor facing opening of said compartments, said damper dimensioned to cover the inlet and outlet section openings of the other of said compartments;

means interconnecting said dampers for selectively positioning said dampers to a first cooling position including;

a plurality of support members positioned in said housing;

a flexible member having a continuous length being arranged on said support members so that a substantially straight portion is arranged adjacent said front and rear facing openings of said housing;

indexing means on said straight portions of said flexible members arranged diametric relative to front and rear facing openings;

retaining means on said front and rear dampers being dimensioned to engage said indexing means for interconnecting said dampers on said flexible member wherein when the first damper is arranged so that the indoor facing inlet and outlet section openings of said evaporator compartment communicate with the enclosure, the second damper is arranged so that the outdoor facing inlet and outlet section openings of said condenser compartment communicate with said outdoors for cooling the air in said enclosure and to a second heating position wherein when the first damper is arranged so that the indoor facing inlet and outlet section openings of said condenser compartment communicate with the enclosure, the second damper is arranged so that the outdoor facing inlet and outlet section openings of said evaporator compartment communicate with said outdoors for removing heat from the outdoor air by cooling the air.

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**4,297,856**

## $^3$He-$^4$He DILUTION REFRIGERATOR

**Frans A. Staas; Willem van Haeringen, and Adrianus P. Severijns, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

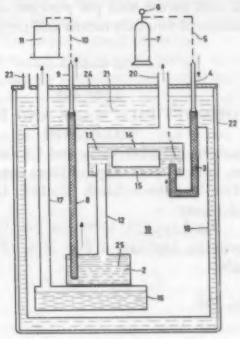
**Filed Mar. 10, 1980, Ser. No. 128,706**

**Claims priority, application Netherlands, Mar. 14, 1979, 7902014**

**Int. Cl.$^3$ F25B *19/00***

**U.S. Cl. 62—514 R** **3 Claims**

1. A $^3$He-$^4$He dilution refrigerator for producing very low temperatures, which comprises two chambers respectively situated at different levels, the upper chamber forming a mixing chamber for mixing liquid concentrated $^3$He and superfluid $^4$He and the lower chamber forming a segregating chamber for separating concentrated $^3$He and superfluid $^4$He; a superleak opening into the mixing chamber for supplying superfluid $^4$He to the mixing chamber; a connection duct having a lower end opening near the top of the segregating chamber; an auxiliary chamber, the upper end of the connecting duct opening thereinto; a supply duct between the upper part of the auxiliary chamber and the upper part of the mixing chamber for flow of concentrated $^3$He to the upper part of the mixing chamber; and an outlet duct between the lower part of the mixing chamber



and the lower part of the auxiliary chamber for flow of dilute $^3$He to the lower part of the auxiliary chamber.

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**4,297,857**

## APPARATUS FOR KNITTING TERRY LOOPS ON A CIRCULAR HOSIERY MACHINE

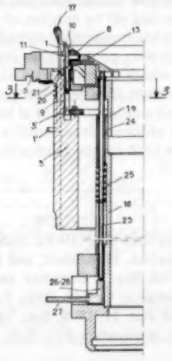
**Giovanni Busi, via Tito Speri 116, Botticino Sera, Brescia, Italy**

**Filed Jul. 30, 1979, Ser. No. 61,897**

**Claims priority, application Italy, May 2, 1978, 5181 A/78**

**Int. Cl.$^3$ D04B *9/12***

**U.S. Cl. 66—9 R** **12 Claims**



1. Apparatus for knitting terry loops in a fabric on circular hosiery machines with at least one feeding station, comprising a selectively rotatable cylinder having a plurality of axially extending, angularly spaced apart grooves formed therein, a plurality of axially displacable needles individually guided in said grooves, a sinker bed encircling said cylinder, a plurality of radial sinkers carried by said cylinder and cooperating with said needles, means for feeding at least two yarns concurrently to said needles in correspondence with at least one working station, a sleeve positioned in said cylinder, said sleeve having a plurality of longitudinally extending grooves spaced apart angularly over at least a part thereof and a pin punch positioned in an guided by each of said longitudinaly grooves, said pin punches being alternately positioned with said needles of said cylinder, said pin punches each having a butt facing and protruding toward the center of said sleeve and defining a guide path for said butts of said pin punches for the raising and lowering thereof; said pin punches being raised upwardly to form the terry loop of the fabric with at least one of the fed

yarns, the needles of the cylinder being lowered to knit the remainder of the fabric, and cam means positionable vertically and arranged to engage said pin punches whereby in one position of said cam means said pin punches are actuated and in another position of said cam means said pin punches are deactivated.

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**4,297,858**

## HIGH DENSITY PILE WARE AND THE PROCESS THEREFOR

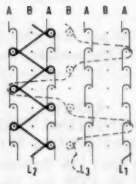
**Helmar Blasberg, Obertshausen, and Christian Wilkens, Heusenstamm, both of Fed. Rep. of Germany, assignors to Karl Mayer Textilmaschinenfabrik GmbH, Obertshausen, Fed. Rep. of Germany**

**Filed Sep. 27, 1979, Ser. No. 79,431**

**Claims priority, application Fed. Rep. of Germany, Oct. 4, 1978, 2843250**

**Int. Cl.³ D04B *7/12***

**U.S. Cl. 66—194** **9 Claims**




1. A process for preparing pile ware on a needle bed of a warp knitting machine wherein the pile loops formed from one thread system are tied off by stitches of a ground fabric structure formed by at least one other thread system, the improvement which comprises providing at least one ground fabric structure thread which is elastic, said elastic thread having an elastic elongation limit of at least 400% and said elastic thread being worked with an elongation of at least 100% and forming the pile loops by utilizing those needles that are disposed between the needles used for the fabrication of the ground fabric structure.

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**4,297,859**

## AUTOMATIC TOWEL DISPENSER

**Hugo-Werner Geschka, Düsseldorf, and Bernd Beitecke, Dortmund, both of Fed. Rep. of Germany, assignors to LuK Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany**

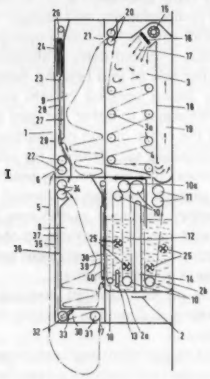
**Filed Jun. 21, 1979, Ser. No. 50,639**

**Claims priority, application Fed. Rep. of Germany, Jun. 21, 1978, 2827180**

**Int. Cl.³ A47K *10/30***

**U.S. Cl. 68—13 R** **4 Claims**

1. An automatic towel dispenser having a housing formed with a delivery slot and an inlet slot and containing a washing and a drying chamber for an endless towel passable therethrough and having a cleaned section available for use extending outside the housing between the delivery slot and the inlet slot, respectively, formed in the housing, means defining a path of travel of the endless towel from the inlet slot to the washing chamber and from the drying chamber to the delivery slot, the housing also containing a first supply chamber for variably stacking a plurality of soiled towel sections of the endless towel in loops therein, the first supply chamber being located between the inlet slot and the washing chamber, as viewed in travel direction of the towel, and the housing further containing a second supply chamber for variably stacking a plurality of cleaned towel sections of the endless towel in loops therein, the second supply chamber being located between the drying chamber and the delivery slot, as viewed in travel direction of the towel, the travel path of the endless towel including a travel path portion for the soiled towel sections through the washing and drying chambers wherein the soiled towel sections are, respectively, washed and dried, respective travel path portions extending from above into the first and the second supply chamber for depositing, respectively, the soiled and the cleaned towel sections therein from above, and respective travel path portions extending upwardly from below out of the first and the second supply chamber for withdrawing the respective soiled and cleaned towel sections upwardly from below an overlying loop thereof, past the respective supply of towel sections and out of the respective supply chambers, the improvement therein comprising guide means disposed in an



upper region of the second supply chamber, the inlet slot being located in the towel dispenser below the first supply chamber, and the delivery slot being located in a middle region of the towel dispenser, said guide means defining a reversing part of the travel path for reversing upward travel of the towel sections in the second supply chamber into downward travel thereof out of the delivery slot and means for guiding the towel sections out of the delivery slot and reintroducing them, in the form of a loop extending around a region adjacent the middle region of the towel dispenser, into the housing through the inlet slot.

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**4,297,860**

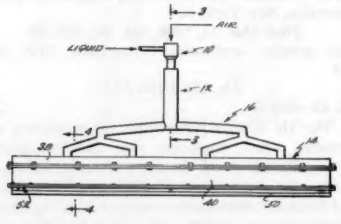
## DEVICE FOR APPLYING FOAM TO TEXTILES

**Joseph A. Pacifici, LaGrange, Ga., and Jerry L. White, Riverview, Ala., assignors to West Point Pepperell, Inc., West Point, Ga.**

**Filed Jul. 23, 1980, Ser. No. 171,277**

**Int. Cl.³ D06B *1/08***

**U.S. Cl. 68—200** **13 Claims**




1. A device for applying foam to textiles, comprising:

a source of foam;

an applicator joined to said source for receiving foam therefrom, said applicator comprising first and second portions separated by an apertured plate, said first portion being joined to the source for receiving foam therefrom, said foam

being spread across the applicator by the plate and passing through the apertures therein to said second portion, said second portion containing porous material and having a configuration which converges towards an elongated discharge orifice whereby said foam is uniformly distributed across the orifice.

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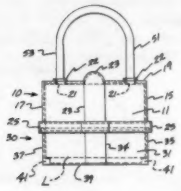
**4,297,861**
**LOCK COVER**

**James R. Dykes, 540 E. 60th St., Savannah, Ga. 31405**

**Filed Nov. 13, 1979, Ser. No. 93,739**
**Int. Cl.³ E05B *67/38***
**U.S. Cl. 70—55** **8 Claims**



1. An improved cover for a padlock to protect the body of same from the elements comprising:

(a) a bottom cover portion to be received around a lower portion of the lock body, said bottom cover portion having a bottom wall with an elongated thin wall membrane section therein, said bottom wall having means associated therewith to space a lower end of a lock body therefrom; said cover portion further having connector means thereon; and

(b) a top cover portion to be received around an upper portion of the lock body, said top cover portion having connector means thereon mateable with connector means on said bottom portion to removably secure said top and bottom portions around said lock body to enclose same, aid top cover portion having a top wall defining two spacially separate shackle leg receiving openings, said openings receiving said shackle legs in a snug fitting relationship, said top cover portion further having means thereon to permit variation of the space between said shackle receiving openings, whereby the snug fitting relationship between the openings and the shackle legs is maintained when small variation exists in space between the shackle legs.

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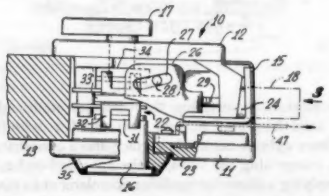
**4,297,862**
**LOCK MECHANISM WITH REMOVABLE CYLINDER HOLDER**

**Paul G. Solovieff, 14291 Browning Ave., Apt. 52, Tustin, Calif. 92680**

**Filed Feb. 23, 1979, Ser. No. 14,418**
**Int. Cl.³ E05B *9/08***
**U.S. Cl. 70—129** **18 Claims**



1. A door lock including a pair of escutcheons engaging opposite sides of a door, a bolt reciprocable between an extended position in which it projects from a swingable edge of said door and a retracted position in which it is disposed within said door, a face plate overlying said edge and having a bolt aperture therein through which said bolt can move, an externally threaded lock cylinder including a rotatable core adapted to receive a key, and a linkage connecting said lock cylinder to said bolt, wherein the improvement comprises:

an internally threaded ring-shaped holder in which said cylinder is threadedly mounted, said holder having at least one lug projecting outwardly therefrom adjacent said core;

an aperture of generally circular outline in one of said escutcheons in which said holder is removably received and is rotatable between a secured position and a released position;

retaining means disposed between said escutcheons for normally securing said holder to said apertured escutcheon and for releasing said holder upon actuation thereof, said retaining means comprising a latch member movable toward and away from said holder for engagement with said lug, and spring means for resiliently urging said latch member toward said holder, said latch member and said lug having cam surfaces that are mutually engageable upon rotation of said holder; and

a release aperture in said face plate by which said retaining means is accessible for actuation thereof to disengage said latch member from said lug by moving said latch member against the urging of said spring means, thereby permitting said holder to be rotated from said secured position to said released position.

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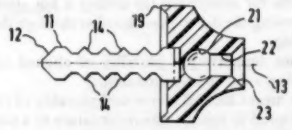
**4,297,863**
**ANTILOCK-FREEZING DEVICE**

**Wilfried Glock, Liebenzeller Str. 11/1, 7032 Sindelfingen, Fed. Rep. of Germany**

**Filed Sep. 17, 1979, Ser. No. 75,973**
**Claims priority, application Fed. Rep. of Germany, Sep. 23, 1978, 2841450**
**Int. Cl.³ E05B *19/00***
**U.S. Cl. 70—395** **6 Claims**



1. A device for preventing motor vehicle locks having a key slot from freezing, comprising:

a flat strip section which fits in width and height into the key slot like the portion of a key associated with this lock, and

a grip stud provided at one end of the flat strip section in which said one end of the flat strip section is anchored,

said flat strip section being made of metal and having corrosion protection,

said grip stud comprising two parts and a detent connection in the form of a press-stud connection, operable by hand, for connecting and separating said grip stud parts to and from each other,

said detent connection being rotationally symetrical,

said flat strip section being enclosed in one of said parts.

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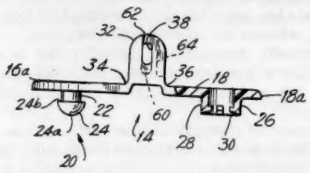
**4,297,864**
**KEY HOLDER**

**Hanns W. Beier, 853 Scarsdale Rd., Crestwood, N.Y. 10707**

**Filed May 28, 1980, Ser. No. 154,004**
**Int. Cl.³ A47G *29/10***
**U.S. Cl. 70—456 B** **7 Claims**

1. A key holder for a key comprising a snap lock permanently attachable to the key the snap lock having a configured slot therein, and a spring clip, the spring clip including a re-

tainer engageable in the slot and a ring attached to the retainer, the ring having one free end biased toward but bendable away




from the snap lock, to enable ready attachment to and removal from a key ring.

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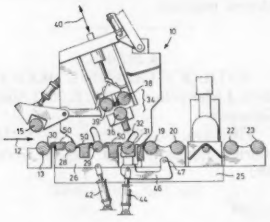
**4,297,865**

## METAL STRIP DOWNCOILERS

**William Smith, Burlington, Canada, assignor to The Steel Company of Canada, Ltd., Hamilton, Canada**

**Filed Mar. 17, 1980, Ser. No. 130,718**
**Claims priority, application Canada, Mar. 30, 1979, 11180**
**Int. Cl.³ B21C *47/00***
**U.S. Cl. 72—146** **4 Claims**




1. Apparatus for selectively (a) coiling a hot steel transfer bar or (b) allowing the bar to pass uncoiled through the apparatus, comprising:

frame means supporting a plurality of aligned rollers for transferring a bar in one direction,

bend roller means located above said plurality of rollers and being adapted to apply a down curvature to a transfer bar passing therethrough,

ramp means upstream of the bend roller means with respect to said one direction and adapted selectively (a) to be placed in the path of a transfer bar to cause the latter to be deflected upwardly to enter said bend roller means, or (b) to allow the transfer bar to pass along said rollers under said bend roller means,

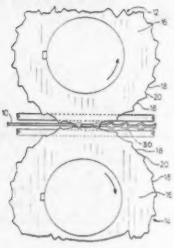
a displaceable roller downstream of the bend roller means and parallel with the rest of the rollers, said displaceable roller being mounted for displacement normal to its axis in a direction having a vertical component, whereby the roller may be moved between a first position in which it lies even with the rest of the rollers, and a second position in which it is raised above the level of the rest of the rollers, said displaceable roller defining an angle with two rollers sequentially downstream of it, the vertex of the angle being at the adjacent downstream roller, whereby the angle changes from 180° to an obtuse angle as the displaceable roller moves from its first to its second position, said displaceable roller in said second position defining, with said two sequentially downstream rollers, a cradle in which the convolutions of a coiling transfer bar can be contained, the cradle being capable of enlargement to accommodate the expanding coil by lowering the displaceable roller toward its first position.

**4,297,866**

## ASYMMETRICAL SHAPING OF SLIT SEGMENTS OF MESHES FORMED IN DEFORMABLE STRIP

**Randall T. Sakauye, Mississauga; John V. Marlow, Oakville; Gordon H. Laurie, Mississauga, and Theodore J. Seymour, Oakville, all of Canada, assignors to Cominco Ltd., Vancouver, Canada**

**Filed Sep. 19, 1979, Ser. No. 77,080**
**Claims priority, application Canada, Aug. 1, 1979, 333003**
**Int. Cl.³ B21D *31/02***
**U.S. Cl. 72—186** **12 Claims**



1. A method of forming elongated slit segments in deformable strip comprising concurrently slitting and preforming said strip by intermeshing, substantially convexly shaped tool surfaces each having a linear leading portion and a linear trailing portion joined by a rounded apex portion, said linear leading and trailing portions collinear with and generally defining portions of the sides of a triangle having a base wherein said base has a length equal to the length of the strip being slit and the length of the side of the triangle corresponding to and collinear with the leading portion is less than the length of the side of the triangle corresponding to and collinear with the trailing portion and the angle formed between the said side of the triangle corresponding to the leading portion and the base is not greater than 90°.

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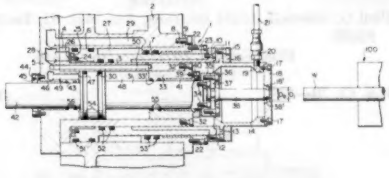
**4,297,867**

## PIPE END EXPANDING OR CONTRACTING PROCESS UTILIZING IRONING

**Masaru Masaki, Aichi; Yoshinori Ito; Akihiko Inoue, both of Toyota, and Munetaka Toda, Kariya, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan**

**Filed Jun. 29, 1979, Ser. No. 53,524**
**Claims priority, application Japan, Nov. 15, 1978, 53-140608**
**Int. Cl.³ B21D *22/00***
**U.S. Cl. 72—347** **7 Claims**



1. A process for altering the diameter uniformly over a certain axial length of an end portion of a cylindrical pipe which has a cylindrical inside surface and a cylindrical outside surface, comprising the steps, in the specified order, of:

(a) applying a diameter modification element having a cylindrical surface of at least said certain axial length to one of said cylindrical surfaces of the pipe over said certain axial length, so as to modify the diameter of said end portion; and

(b) maintaining said diameter modification element in the position it assumed at the completion of step (a), and

(c) squeezing said diameter-modified end portion of the pipe between said cylindrical surface of said diameter modification element, and an ironing element which is applied to the other said cylindrical surface of the pipe by moving said ironing element axially over said diameter-modified end portion with a clearance between itself and said cylindrical surface of said diameter modification element which is less than the thickness of said diameter-modified end portion.

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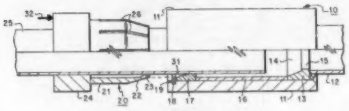
**4,297,868**

## PIPE SIZING AND GROOVING APPARATUS

**John J. Hunter, 1410 Willow Pond, Abilene, Tex. 79602**

**Filed Oct. 4, 1979, Ser. No. 81,778**
**Int. Cl.³ B21D *39/04***
**U.S. Cl. 72—402** **6 Claims**



1. Apparatus for forming an annular recess in the external surface of a pipe comprising:

(a) a first cylindrical body concentrically positionable and axially moveable over said pipe, said cylindrical body having an internal diameter in at least the central portion thereof larger than the external diameter of said pipe;

(b) an inwardly projecting lip on the internal surface of said cylindrical body adjacent one end thereof with the external diameter of said first body increasing axially from said one end thereof forming a tapered external surface adjacent said one end thereof;

(c) a plurality of axial slots in said cylindrical body extending through said lip; and

(d) means for radially compressing said one end of said cylindrical body whereby said lip is pressed into and forms an annular groove in said pipe, said means for radially compressing said one end of said first cylindrical body comprising a ring surrounding said pipe, said ring having a tapered internal surface mating with said tapered external surface when said tapered external surface is axially telescoped within said ring wherein said ring is a sizing ring maintained within a sizing tool, the smallest internal diameter of said sizing ring corresponding to the desired external diameter of said pipe.

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**4,297,869**

## APPARATUS FOR FABRICATING PULLEY RIMS

**William G. Oldford, Lexington, Mich., assignor to U.S. Industries, Inc., Oak Brook, Ill.**

**Filed Sep. 10, 1979, Ser. No. 73,617**
**Int. Cl.³ B21D *43/04***
**U.S. Cl. 72—405** **17 Claims**

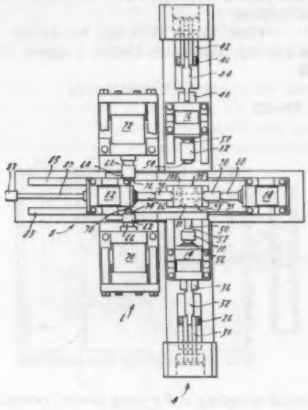
1. An apparatus for manufacturing a pulley rim from a cylindrical pulley rim blank comprising

a first press having a pair of opposed dies with frusto-conical portions thereon;

a second press having a pair of opposed dies with frusto-conical portions thereon;

clamping means for transporting said pulley rim blank from said first press to said second press;

said claming means including a clamping assembly and means for moving said clamping assembly between a first position wherein said rim blank is axially aligned with said first press and a second position wherein said rim blank is axially aligned with said second press; and



a frame supporting said first press, second press, and said clamping means for transporting said pulley rim blank.

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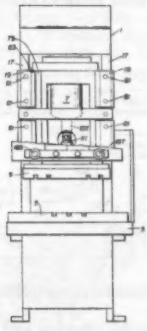
**4,297,870**

## HYDRAULIC PRESS WITH INTEGRAL KNOCKOUT AND STROKE CONTROL

**Eugene W. Pearson, Orinda, Calif., and Wilbur G. Short, Browns, Ill., assignors to Canron Corp., Oakland, Calif.**

**Division of Ser. No. 875,353, Mar. 20, 1978, Pat. No. 4,242,901.**
**This application Mar. 9, 1979, Ser. No. 19,184**
**Int. Cl.³ B21J *7/46***
**U.S. Cl. 72—443** **6 Claims**

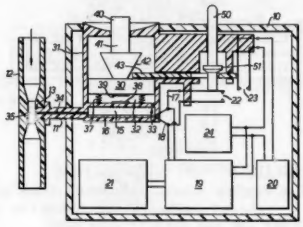


1. A press comprising a frame including a bed, a bolster on said bed for holding one of a pair of complementary dies, reciprocal variable speed drive means for producing a work stroke and a return stroke supported by said frame above said bed for carrying a bolster to which may be affixed the other of said complementary dies, said drive means including a hydraulic piston/cylinder assembly for providing said work and return stroke, means for selecting various speed changes of said upper die during said work stroke and said return stroke and means for controlling the duration of said various speeds relative to time, whereby die travel at a specific speed is a function of time of travel at such speed.

## 4,297,871
## GAS SAMPLING DEVICES

**Basil M. Wright, 95, Uxbridge Rd., Rickmansworth, Hertfordshire, and Thomas P. Jones, 20, South Rd., Sully, Glamorgan, both of England**

**Filed Nov. 5, 1979, Ser. No. 91,502**
**Claims priority, application United Kingdom, Nov. 3, 1978, 43194/78**
**Int. Cl.³ G01N *1/14***
**U.S. Cl. 73—23** **14 Claims**



1. A breath sampling and testing device, comprising a sampling chamber, detector means for detecting a consituent of the gas in said chamber, an open ended breathing tube having a branch passage, a gas displacement element associated with a resilient means and arranged to draw a sample of gas through said branch passage into said sampling chamber, means for sensing a reduction in flow rate in said breathing tube, and arranged automatically to release said displacement element so as to draw a sample of gas through said branch passage into said chamber.

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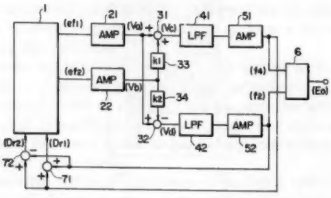
## 4,297,872
## VIBRATION TYPE TRANSDUCER

**Kyoichi Ikeda, and Motoyoshi Ando, both of Musashino, Japan, assignors to Yokogawa Electric Works, Ltd., Tokyo, Japan**

**Filed Dec. 31, 1979, Ser. No. 108,477**
**Claims priority, application Japan, Jan. 11, 1979, 54-2089**
**Int. Cl.³ G01N *9/00*; G01L *11/00*; G01H *13/00***
**U.S. Cl. 73—32 A** **8 Claims**

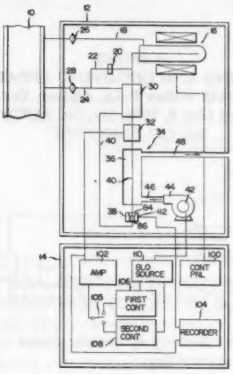


1. A vibration type transducer comprising:
a vibrator,
vibration drive means for vibrating said vibrator in at least two vibration modes,
at least two vibration detection means for detecting frequency signals corresponding to said vibration modes of said vibrator,
an adder circuit coupled to said vibration detection means for adding said frequency signals of said vibration detecting means,
a subtracter circuit coupled to said vibration detection means for subtracting said frequency signals of said vibration detection means, and
an arithmetic circuit coupled to said adder circuit and said subtracter circuit for providing an output signal corresponding to a physical quantity to be measured.

## 4,297,873
## PLUGGING DEVICE

**Hiromichi Nei; Ryoichi Ohtani, both of Yokohama; Iwao Ohshima, Kawasaki, and Yuji Horikawa, Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan**

**Filed Jun. 5, 1979, Ser. No. 45,661**
**Claims priority, application Japan, Jun. 13, 1978, 53-71094**
**Int. Cl.³ G01N *15/00***
**U.S. Cl. 73—61 LM** **11 Claims**



1. A plugging device comprising a pump for introducing liquid metal from a main pipe, a cooler for cooling the liquid metal introduced by said pump, a plugging orifice having an orifice hole through which said cooled liquid metal is passed, said orifice hole having a taper portion spreading out toward the upper-course side and a straight pipe portion with a restricted aperture on the lower-course side adjacent thereto, whereby impurities dissolved in said liquid metal are precipitated mainly at said straight pipe portion to increase the flow resistance, a flow meter for measuring the flow rate of said liquid metal, a thermometer for measuring the temperature of the liquid metal flowing through said plugging orifice, and a control block for controlling the cooling capability of said cooler in response to a flow rate signal delivered from said flow meter, said cooler including a motor to rotate at a speed proportional to a DC voltage supplied from said control block and a blower driven by said motor, so that the plugging temperature of said liquid metal is determined from the temperature measured by said thermometer.

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## 4,297,874
## APPARATUS FOR MEASURING A PERCENTAGE OF MOISTURE AND WEIGHING OF A SHEET-LIKE OBJECT

**Shinichi Sasaki, 5-17-19,, Tokiwa, Urawa-shi, Saitama-ken, Japan**

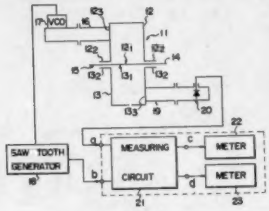
**Filed Oct. 26, 1979, Ser. No. 88,570**
**Int. Cl.³ G01G *7/00*; G01N *27/06*; G01R *27/00***
**U.S. Cl. 73—73** **10 Claims**

1. Apparatus for measuring the moisture content and weight of a sheet-like object comprising:
(a) a single cavity resonator having a pair of metal boxy sections with openings arranged spaced from and facing each other thereby providing a gap therebetween for insertion of said sheet-like object,
(b) means for generating microwave signals,
(c) means for coupling said microwave signals to one of said metal boxy sections,
(d) a microwave detector,
(e) means for coupling microwave signals from the other of said metal boxy sections to the detector, said coupled

microwave signals being attenuated and shifted in frequency at a resonance condition of said cavity resonator when said sheet-like object is inserted within said gap,

(f) said detector generating resonance signals upon detection of a resonance condition, and

(g) circuit means connected to said detector for receiving said resonance signals, said circuit means comprising




(1) means for detecting the amount of attenuation of said resonance signals for substantially determining the moisture content of said sheet-like object, and

(2) means for detecting the resonance frequency of said resonance signals for determining the weight of said sheet like object.

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**4,297,875**

## APPARATUS FOR INTRODUCING A FORCE TO BE MEASURED INTO A BENDING ROD

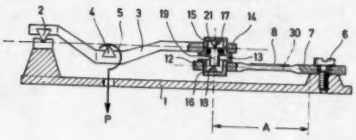
**Ernst Kuhnle, and Josef Schwarz, both of Balingen, Fed. Rep. of Germany, assignors to Bizerba-Werke Wilhelm Kraut KG, Fed. Rep. of Germany**

**Filed Apr. 15, 1980, Ser. No. 140,605**

**Claims priority, application Fed. Rep. of Germany, Apr. 18, 1979, 2915553**

**Int. Cl.³ G01L *1/22***

**U.S. Cl. 73—862.62** **8 Claims**




1. Apparatus for introducing a force to be measured from a force transfer element into the free end of a bending rod held rigidly at one end, said apparatus comprising means for guiding the force transfer element in the direction of said bending rod, a first rounded contact surface on the force transfer element, a second rounded contact surface on the bending rod, a coupling element having first and second flat parallel spaced substantially horizontal surfaces and interposed between the first and second contact surfaces with its first surface bearing against the first contact surface and its second surface bearing against the second surface, and means for holding the coupling element substantially centrally and resiliently relative to the first and second contact surfaces.

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**4,297,876**

## ULTRASONIC TIRE TESTING APPARATUS

**Arnold A. Weiss, Minneapolis, Minn., assignor to AMF Incorporated, Santa Ana, Calif.**

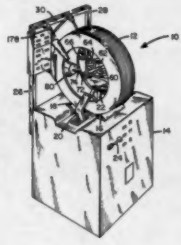
**Filed Aug. 29, 1979, Ser. No. 70,720**

**Int. Cl.³ G01M *17/02***

**U.S. Cl. 73—146** **4 Claims**

1. In an ultrasonic tire casing inspection system of the type in which a vehicle tire casing to be inspected is disposed in air in a non-contact relationship between at least one ultrasonic wave transmitting transducer and at least one ultrasonic wave receiving transducer, said receiving transducer providing an output to an amplifier device, a method for preventing transmitted ultrasonic energy waves which travel through the air and around said tire casing from interfering with the analysis of the ultrasonic energy wave patterns reaching said receiving transducer by passing through said tire casing, comprising the steps of:

(a) transmitting a pulse of ultrasonic energy, the rise time of said pulse being short compared to the transit time of soundwaves in traveling from said transmitting transducer through the air, around the casing, to said receiving transducer, the pulse width being generally equal to twice the transit time of sound waves traveling between said transmitting transducer and said tire casing;



(b) sampling the output of said amplifier device for a predetermined time following the arrival at said receiving transducer of ultrasonic waves passing through said tire casing, but before the arrival of said ultrasonic energy waves which travel through the air around said tire casing; and

(c) repeating steps (a) and (b) at a rate sufficiently low such that the ultrasonic wave signals reaching said receiving transducer from a prior transmitted pulse is less than a predetermined amplitude.

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**4,297,877**

## FORCE MEASURING HUB

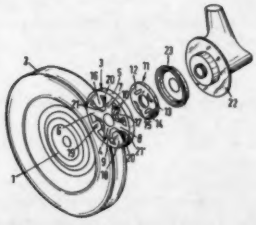
**Reinhard Stahl, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk AG, Wolfsburg, Fed. Rep. of Germany**

**Filed Dec. 27, 1979, Ser. No. 107,579**

**Claims priority, application Fed. Rep. of Germany, Dec. 28, 1978, 2856453**

**Int. Cl.³ G01L *5/16***

**U.S. Cl. 73—146** **3 Claims**



1. In a force measuring hub for measuring forces and/or torques acting in at least the circumferential direction of a wheel-like body supported on a carrier, the force measuring hub including a first annular component adapted for a coaxial attachment to the wheel-like body; the first annular component further having a plurality of radial webs provided with elongation-sensing strips; a second annular component adapted for a coaxial attachment to the carrier; connecting means for opera-

tively coupling the second annular component and the first annular component such that the radial webs lie in a force path passing between the wheel-like body and the carrier; the improvement wherein said first annular component is a flat disc comprising an inner zone adapted to be secured to the wheel-like body and an outer rim surrounding said inner zone; said radial webs being arranged in a single plane between said inner zone and said outer rim; said first annular component further comprising a plurality of extensions attached to said outer rim and oriented radially inwardly therefrom in said single plane into respective spaces defined between adjoining said radial webs; each said extension terminating at a clearance from said inner zone; said second annular component being disc-shaped and including mounting projections extending into respective clearances between said inner zone and the respective extension of said first annular component.

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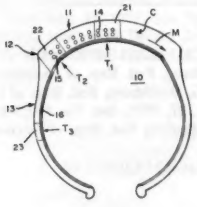
**4,297,878**

## MEASURING COEFFICIENT OF RADIAL DAMPING OF TIRE WALL SEGMENT

**Dusan C. Prevorsek, and Young D. Kwon, both of Morristown, N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.**

**Filed Mar. 7, 1980, Ser. No. 128,074**
**Int. Cl.³ G01M *17/02***
**U.S. Cl. 73—146** **12 Claims**




1. A method of measuring the coefficient of radial damping per unit length of a tire wall at a predetermined frequency of strain which comprises:

(a) applying a cyclic sinusoidal strain component at a predetermined frequency and at a predetermined amplitude to a tire wall segment, said strain being applied in a direction substantially normal to the segment at the point where strain is applied; and

(b) continuously measuring the stress on the tire wall segment at a point spaced from the point where strain is applied in a direction along the segment, the stress being measured in a direction substantially parallel to the direction in which the strain component is applied; the coefficient radial damping per unit length of wall being calculable as

$(1.5\Delta E)/(\pi m(\Delta S)^2 \cdot OM)$

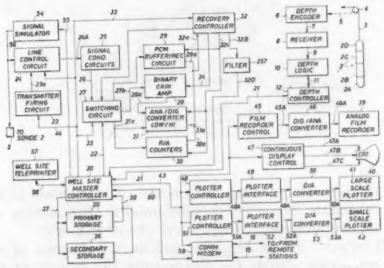
where m is the normal distance between the application of strain and the measurement of stress; $\Delta S$ is the predetermined amplitude; OM is the angular velocity of the cyclic sinusoidal strain component and $\Delta E$ is the measured energy loss per cycle.

**4,297,879**

## WELL LOGGING CORRELATION METHOD AND APPARATUS

**Anthony P. Howells, 12503 Mile Dr., Houston, Tex. 77065; Ronald E. Diederich, 4015 Swarthmore, Houston, Tex. 77005, and Jorg A. Angehrn, 2606 Brammel Timbers La., Houston, Tex. 77068**

**Filed Jul. 2, 1979, Ser. No. 54,072**
**Int. Cl.³ E21B *49/00***
**U.S. Cl. 73—152** **98 Claims**




37. A method of investigating the character of subsurface earth materials and the like traversed by a borehole, comprising

deriving an electrical command signal as a function of borehole depth,

deriving a first electrical measurement of said earth materials in response to said command signal,

deriving a second electrical measurement of said earth materials, and

adjusting said command signal in functional relation with said first and second measurements.

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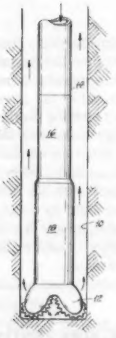
**4,297,880**

## DOWNHOLE PRESSURE MEASUREMENTS OF DRILLING MUD

**Eugene L. Berger, Houston, Tex., assignor to General Electric Company, Philadelphia, Pa.**

**Filed Feb. 5, 1980, Ser. No. 119,041**
**Int. Cl.³ E21B *47/10***
**U.S. Cl. 73—155** **4 Claims**




1. Intrusion detection means for detecting the intrusion into a well bore of material having a density different from that of the drilling mud comprising:

a drill string having an instrumentation sub as a part thereof; said instrumentation sub having a passage for drilling mud therein;

a first pressure transducer in said instrumentation sub exposed to the pressure of the drilling mud in said passage

and producing an electrical signal representative thereof; and

a second pressure transducer in said instrumentation sub exposed to the pressure of the drilling mud outside said instrumentation sub and producing an electrical signal representative thereof.

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**4,297,881**

**HOT-WIRE FLOW RATE MEASURING APPARATUS**

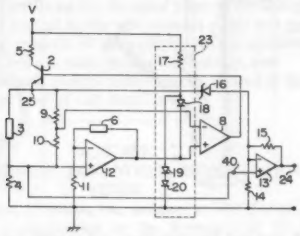
**Takao Sasayama, Hitachi; Yutaka Nishimura, Katsuta; Shinichi Sakamoto, Hitachi, and Masayuki Miki, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Sep. 24, 1979, Ser. No. 78,468**

**Claims priority, application Japan, Sep. 22, 1978, 53-117051**

**Int. Cl.³ F02M *51/00*; G01F *1/68***

**U.S. Cl. 73—204** **39 Claims**



**1.** A hot-wire flow rate measuring apparatus comprising:

a first series circuit including a first thermo-sensitive resistive element placed in the fluid path of fluid and a first resistive element,

a circuit for dividing the voltage across said first thermo-sensitive resistive element;

a second thermo-sensitive resistor for temperature compensation placed in the fluid path of fluid;

means for detecting the difference between the output voltage of said voltage dividing circuit and the output voltage of said second thermo-sensitive resistor for temperature compensation;

means for controlling current fed to said first series circuit in accordance with the detected voltage from said detecting means; and

output means for producing a voltage in accordance with the voltage across said resistive element, and

wherein the output voltage of said output means indicates a flow rate of fluid, and further comprising

a second resistive element connected in series with said second thermo-sensitive resistive element to form a second series circuit therewith; and

means for controlling the voltage across said second series circuit so that the voltage across said first resistive element and the voltage across said second resistive element are equal to each other, and

wherein the voltage across said second series circuit is applied to said detecting means as said output voltage across said thermo-sensitive resistive element for temperature compensation.

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**4,297,882**

**WHEEL BALANCER TRANSDUCER MOUNT WITH IMPROVED SIGNAL TO NOISE RATIO**

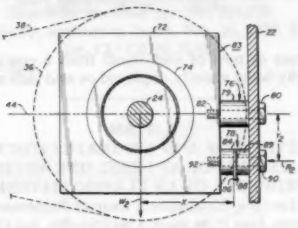
**Donald B. Curchod, Saratoga, and Donald R. Sherman, San Jose, both of Calif., assignors to Autotron Equipment Corporation, Mountain View, Calif.**

**Filed Apr. 24, 1980, Ser. No. 143,430**

**Int. Cl.³ G01M *1/16***

**U.S. Cl. 73—460** **6 Claims**

**1.** In a wheel balancer of the type including a shaft having a proximal end and a remote end remote from said proximal end, means for mounting a wheel/tire assembly on said shaft adjacent said proximal end, a drive train coupled to said remote end for imparting rotation to said shaft and said wheel/tire assembly, said drive train coacting with said shaft along an imaginary line that extends in a given direction radially of said shaft, proximal and remote bearing blocks disposed adjacent respective said ends of said shaft, and bearings mounted in respective said bearing blocks for supporting said shaft for rotation relative thereto, improved mounting apparatus for said bearing blocks comprising a rigid support member defining a substantially nondeformable surface, means for supporting said surface on the side of said shaft opposite said given direction and substantially perpendicular to said imaginary line, a remote passive mount for supporting said remote bearing block in spaced apart relation to said surface, said remote passive mount being disposed in coaxial alignment with said imaginary line so



that vibratory motion imparted to said remote bearing block by said drive train produces no significant moment about said remote passive mount, a remote active mount extending between said surface and said remote bearing block at a point spaced from said remote passive mount by a first distance so that said remote active mount is subjected to alternate compressive and tensive forces in response to rotation of an unbalanced wheel/tire assembly mounted on the second end of said shaft, said remote active mount including transducer means for producing an electric signal that varies as a function of said compressive and tensive forces, and means for mounting said proximal bearing block to said rigid support member, said proximal bearing block mounting means including transducer means for producing an electrical signal indicative of forces imparted to said proximal bearing block in response to rotation of an unbalanced wheel/tire assembly mounted on the second end of said shaft.

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**4,297,883**

**RATE OF TURN INDICATOR**

**E. Paul Shannon, Rte. 2, Box 249, Killen, Ala. 35645**

**Filed Dec. 13, 1979, Ser. No. 103,354**

**Int. Cl.³ G01P *9/02*; G01C *19/42***

**U.S. Cl. 73—504** **34 Claims**

**1.** Rate of turn indicator comprising:

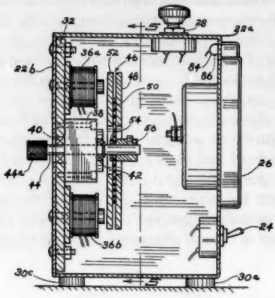
a. support member including at least one drive coil and at least two pickup coils positioned about an axis with respect to each other on said member;

b. bearing means mounted on said axis of said support member;

c. magnetic gyro wheel means including at least two magnet domains of alternating poles positioned about the periphery of a flexible material and axially supported in said bearing means; and,

d. signal processing means connected to said pickup coil and

including visual indicating means whereby said magnetic gyro wheel induces currents in said pickup coils subject to



the rate of turn of said vessel from a course of travel thereby being visually displayed on said indicating means.

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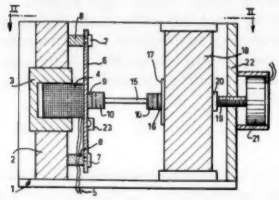
**4,297,834**

## METHOD OF AND APPARATUS FOR THE MEASUREMENT OF AT LEAST ONE MECHANICAL PROPERTY OF AN ELASTIC MATERIAL

**Jean-Luc Leveque, Montfermeil; Laurent Rasseneur, Thorigny-sur-Marne; Jean P. de Rigal, Claye Souilly, and Gilbert Gras, Aulnay Sous Bois, all of France, assignors to L'Oreal, Paris, France**

**Filed Aug. 10, 1979, Ser. No. 65,443**
**Claims priority, application France, Aug. 31, 1978, 78 25149**
**Int. Cl.³ G01N *3/38, 33/48***
**U.S. Cl. 73—579** **12 Claims**



1. Apparatus for measuring a mechanical property of an elastic material comprising, a fixed frame; a mobile assembly carried by the frame; an electromagnetic operating device having at least one coil for vibrating the mobile assembly relative to the frame, said mobile assembly having a first securing element rigid therewith for securing the sample to be tested; a second securing element carried by the frame whereby the sample to be tested may be disposed and held between the said first and second securing elements; means for displacing the second securing element in the frame for, in use of the apparatus, changing the mechanical tension of a sample secured between the said first and second securing elements; an electronic circuit associated with the electromagnetic operating device for providing a supply of electricity at the appropriate frequency to said coil; at least one device for the receipt of data provided by the aforesaid electronic circuit, and force measuring means mounting the second securing means for providing a signal indicative of the tension in a sample being tested.

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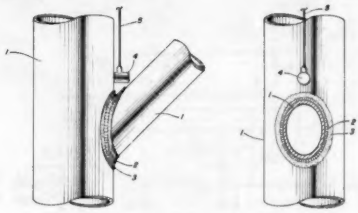
**4,297,885**

## ACOUSTIC EMISSION FOR DETECTION AND MONITORING OF CRACK INITIATION AND PROPAGATION IN MATERIALS

**Norman W. Hein, Jr., and Donald H. Oertle, both of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.**

**Filed Oct. 24, 1979, Ser. No. 87,918**
**Int. Cl.³ G01N *29/04***
**U.S. Cl. 73—587** **16 Claims**



1. A method for detecting and monitoring initiation and propagation of cracks in materials comprising

(a) adhering an acoustical emitter selected from the group consisting of brittle plastics, glass rods and strips, fiberglass, cadminum metal, tin metal, micarta, boron/epoxy reinforced strips, boron/aluminum reinforced strips, graphite/epoxy liminates and silicon carbide fiber laminates to the area to be monitored, and

(b) monitoring for acoustical signals emitted by the adhered material, indicating crack initiation or propagation into the adhered material.

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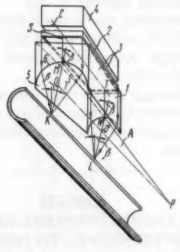
**4,297,886**

## ULTRASONIC FLAW DETECTOR FOR IMMERSION TESTING OF ARTICLES

**Yakov F. Anikeev, ulitsa Stanichnaya, 82, kv. 2; Nikolai N. Panikov, ulitsa S. Kovalevskoi, 8, kv. 87, and Viktor N. Ripny, ulitsa Pravdy, 113, kv. 20, all of Dnepropetrovsk, U.S.S.R.**

**Filed Jun. 15, 1979, Ser. No. 49,485**
**Int. Cl.³ G01N *29/04***
**U.S. Cl. 73—642** **6 Claims**



1. In an ultrasonic flaw detector for immersion testing of articles of the type having a focusing plane concave lens, provided with a concave surface, the focusing lens having a trapezoidal-shape, a piezoelectric plate having a symmetrical trapezoidal form with the electrodes applied to the surface thereof capable of being fed with high-frequency electric oscillations for causing the piezoelectric plate to generate ultrasonic

oscillations, and an ultrasonic oscillation attenuation unit, said attenuation unit and said piezoelectric plate being placed in immediate contact with each other and said plate and said lens being placed in immediate contact with each other forming a contact plane, said focusing planoconcave lens, said piezoelectric plate and said ultrasonic altenuation unit being arranged in the aforesaid order so that the concave surface of said lens and said piezoelectric plate have a common main plane of symmetry, the improvement comprising:

said concave surface of said lens forming a conical surface,

said contact plane being parellel to the genetrix of said conical surface and being in the form of a trapezoid,

said lens having non-parallel side planes normal to said contact plane and being positioned on opposite sides of said concave surface with said concave surface extending arcuately therebetween, and said non-parallel sides being perpendicular to the bases of said trapezoidally-shaped lens, such that the non-parallel sides of the trapezoidally-shaped lens are formed in the same plane as the side planes of said lens normal to the said contact plane and passing through the genetrix of the conical surface equidistantly from said common main plane of symmetry, and

the directrix of said conical surface being located at the side of the larger base of said trapezoid.

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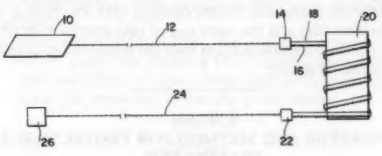
**4,297,887**

## HIGH-SENSITIVITY, LOW-NOISE, REMOTE OPTICAL FIBER

**Joseph A. Bucaro, Herndon, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Feb. 19, 1980, Ser. No. 122,648**
**Int. Cl.³ G02B 5/14**
**U.S. Cl. 73—655** **9 Claims**




1. An acoustic signal sensing device comprising in combination:

acoustic signal sensor means, comprising a pair of optical fibers, at least one of which has acoustical sensitivity, for sensing acoustic signals by their action on the fiber to vary light beam velocity in the fiber and thus produce, in response to an impinging acoustical signal, a differential phase change between light beams simultaneously traversing said optical fibers;

optical-fiber lead-line means for conducting light beams to and from said sensor means;

light-splitting and combining means connected between said sensor means and said lead-line means for splitting an input light beam coming from said lead-line means into two components and feeding each component to a different one of said sensor optical fibers, and for combining the output beams from said optical fibers into a single resultant light beam and feeding it back to said lead-line means; and

detector means for deriving the resultant light beam from said lead-line means and producing an output signal proportional to said differential phase change between the outputs of said optical fibers in said sensor means;

at least one of said optical fibers is formed into a coil;

both said optical fibers have different acoustic sensitivities, are equal in length and are formed into coils each having two ends, an input end connected to said light-splitting and combining means, and a second end,

said lead-line means comprises a single optical fiber,

said sensor device further including mirror means to which said second ends of said optical fibers are connected for reflecting light beams in said fibers back to their input ends.

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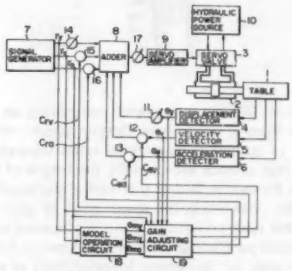
**4,297,888**

## STABILITY CONTROL SYSTEM FOR VIBRATION TEST DEVICE

**Hiromu Hirai, Yatabemachi, and Shin Hamano, Shimoinayoshi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Feb. 26, 1980, Ser. No. 124,958**
**Claims priority, application Japan, Feb. 28, 1979, 54-21857**
**Int. Cl.³ G01N 29/00**
**U.S. Cl. 73—664** **3 Claims**

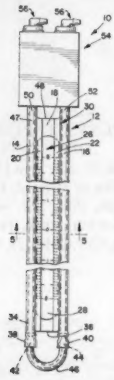



1. In a vibration test device comprising a vibration table, a vibrator for driving said vibration table, a servo-valve for controlling the direction and the flow rate of pressurized fluid supplied to said vibrator, a servo-amplifier for power-amplifying a voltage signal applied thereto and applying the amplified signal to said servo-valve in the form of a current signal, signal generator means for producing command voltage signals representing target values corresponding to states of said vibration table including the displacement, velocity and acceleration thereof, a feedback circuit for converting into state-representing voltage signals feedback elements representing the states of selected one of said vibration table and said vibrator, said states including the displacement and at least one of the velocity and acceleration of said selected one of said vibration table and said vibrator, and an adder for calculating the sum of said command voltage signals produced from said signal generator means and said state-representing voltage signals produced from said feedback circuit and for applying an output voltage signal representing said sum to said servo-amplifier; a stability control system comprises a first gain-adjusting means provided at the input side of said adder, a second gain-adjusting means provided at the output side of said feedback circuit, a model operation circuit for simulating a model response corresponding to the state-representing values of said vibration table in response to said command voltage signals produced from said signal generator means so as to produce model response signals, and a gain-adjusting circuit for applying gain-adjusting signals to said first and second gain-adjusting means in response to said model response signals produced from said model operation circuit, said state-representing voltage signals produced from said feedback circuit and said command voltage signals produced from said first generator means.

## 4,297,889
## ROLL-UP TYPE U-TUBE MANOMETER

**Steven O. Buchanan, and James W. Phillips, both of Michigan City, Ind., assignors to Dwyer Instruments, Inc., Michigan City, Ind.**

**Filed May 27, 1980, Ser. No. 153,030**
**Int. Cl.³ G01L 7/18**
**U.S. Cl. 73—747** **6 Claims**



1. In a roll-up flexible manometer comprising an elongate body formed from a transparent flexible plastic material to define a pair of spaced apart parallel tubes separated by an integral web that extends substantially the length of the tubes and defines a forwardly facing side and a rearwardly facing side, means for connecting the lower ends of said tubes, an elongate flexible scale positioned along the forward side of the web between and paralleling the tubes, and means for slidably mounting the scale for movement longitudinally of said body for effecting zero adjustment of the scale,

the improvement wherein said means for slidably mounting the scale comprises:

a pair of substantially opposed flanges integral with said body and extending longitudinally of same in overlaying closely spaced relation to the forwardly facing side of the web,

one of said flanges being integral with one of the tubes and the other of said flanges being integral with the other tube,

said flanges defining projecting edges that parallel said body and are spaced apart transversely of the body to expose the scale,

said scale having its respective side edges slidably received under the respective flanges,

said flanges and the portion of the web underlying same embracing the respective side edges of said scale substantially continuously therealong,

whereby when the body is rolled up, for storage, the scale uniformly rolls up with same free of crinkling and indentations.

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## 4,297,890
## PRESSURE TRANSDUCER

**Bertil Hök, Uppsala, Sweden, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed May 21, 1980, Ser. No. 151,771**
**Claims priority, application Fed. Rep. of Germany, Jun. 7, 1979, 2923122**
**Int. Cl.³ G01L 9/02**
**U.S. Cl. 73—753** **5 Claims**

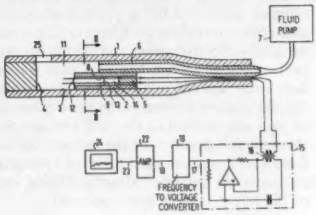
1. A pressure transducer for generating an electrical signal which corresponds to a liquid pressure to be measured within a liquid vessel, said transducer comprising:

an exterior tube (1) having a measurement chamber (11) at a measurement end thereof for direct communication with a liquid pressure to be measured,

an interior tube (2) disposed longitudinally within said exterior tube and having a closed end (5) remote from said chamber and having an open end opening at said chamber for direct fluid communication with a liquid in said chamber,

liquid supply means (6) within said exterior tube and communicating with said chamber,

said liquid supply means providing for the filling of said chamber with a pressure transmission liquid while a gas is entrapped within said interior tube,




said interior tube (2) providing a pressure measuring cell and having sensing means for supplying an electric signal which is a function of the gas volume within said interior tube and thus of the liquid pressure in said chamber,

said exterior tube (1) having an exterior wall with a lateral opening (25) communicating with said chamber transversely opposite from the open end of said interior tube, and

means comprising said lateral opening (25) for placing said chamber (11) and the open end of said interior tube (2) in direct fluid communication with the liquid whose pressure is to be measured.

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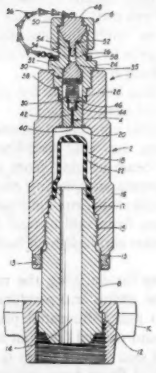
## 4,297,891
## APPARATUS AND METHOD FOR PROTECTING A TRANSDUCER

**Wayne J. Falcon, Duncan, Okla., assignor to Halliburton Services, Duncan, Okla.**

**Filed Jan. 11, 1980, Ser. No. 111,242**
**Int. Cl.³ G01L 7/08**
**U.S. Cl. 73—756** **5 Claims**



1. A system for protecting a transducer connected thereto by damping, through a pressurized fluid, a signal to be converted by the transducer, said system comprising:

a transducer protector apparatus, including:

a housing, including:

a first connector means for connecting said housing with the transducer, said second connector means having an aperture defined therethrough;
a fluid-containing cavity defined within said housing; and
a transducible signal transferring means disposed within said fluid-containing cavity for receiving the transducible signal from the source and for transmitting it to the fluid in said fluid-containing cavity; and
damping means for damping the signal transmitted by said transferring means, said damping means including:
a bore having a predetermined diameter defined in said housing, said bore communicating said fluid-containing cavity with said aperture in said second connector means;
a pin having a predetermined diameter which is less than the predetermined diameter of said bore, said pin disposed within said bore so that a space exists between said pin and the wall of said bore; and
a fluid contained in said space for providing a continuous fluid path through which the transducible signal transmitted by said signal transferring means can dampingly pass around said pin to the aperture of said first connector means; and
means for pressurizing the fluid in said cavity and in the space betwen said bore and said pin, said means for pressurizing the fluid including:
a container having a body of the fluid contained therein;
a duct having a first end thereof disposed in said body of fluid;
a valve having a first end connected to a second end of said duct;
a three-ended connector means having a first end connected to a second end of said valve and a second end connected to said second connector means of said housing; and
a pump connected to a third end of said three-ended connector means for pumping fluid between said container and said protector apparatus so that the fluid within said protector apparatus is thereby pressurized.

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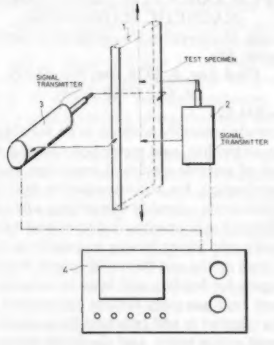
**4,297,892**

## PROCESS AND APPARATUS FOR THE MEASUREMENT OF THE ANISOTROPY VALUE OF FORM CHANGES IN NORMAL DIRECTION IN SHEET METALS

**Ferenc Nagy; Ferenc Szabo, and Zoltan F. Sziics, all of Szekesfehervar, Hungary, assignors to Magyar Aluminiumipari Tröszt, Budapest, Hungary**

**Filed Nov. 27, 1979, Ser. No. 97,795**
**Int. Cl.[3] G01N *3/08***
**U.S. Cl. 73—826** **2 Claims**




2. Apparatus for determining the anisotropy value changes in the normal direction in sheet metals, which apparatus comprises a signal transmitter to determine and convert longitudinal changes in dimension into electric signals, a signal comparator to accept one or more predetermined reference signals corresponding to predetermined anisotropy values and compare them with signals from the signal transmitter, a switching unit operable by the signal from the signal transmitter, identical with or showing a known difference from one of the predetermined reference signals to pass a signal to a display unit to show the appropriate anisotropy value corresponding to the anisotropy value of the predetermined reference signal which operates the switching unit.

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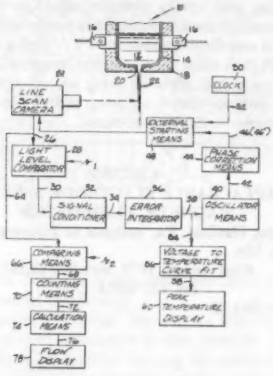
**4,297,893**

## METHOD AND APPARATUS FOR MEASURING FLOW CHARACTERISTICS OF MOVING FLUID STREAM

**Larry J. Weinstein, Littleton, Colo., assignor to Johns-Manville Corporation, Denver, Colo.**

**Filed Feb. 27, 1980, Ser. No. 125,303**
**Int. Cl.[3] G01F *13/00***
**U.S. Cl. 73—861** **20 Claims**




1. A method for estimating flow properties of a moving mass, comprising:
arranging a plurality of sensors in a predetermined array,
exposing said sensors to energy emanating from said mass, each sensor having an output proportional to energy sensed by said sensors;
measuring the output of said sensors at timed intervals,
comparing the output of each sensor with a first value,
varying said time intervals in response to said comparison to ensure that the maximum output of any one sensor is measured at a magnitude which is substantially equal to said first value,
obtaining a count indicative of the number of sensor outputs above a second value, and
generating the magnitude of said flow properties using said count and said intervals.

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**4,297,894**

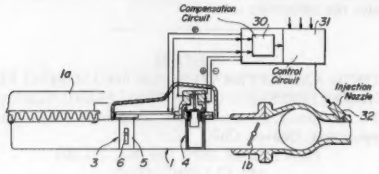
## MASS FLOW SENSOR

**Hatsuo Nagaishi, Yokosuka, and Toru Kita, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan**

**Filed Sep. 5, 1979, Ser. No. 72,695**
**Claims priority, application Japan, Sep. 8, 1978, 53/110396**
**Int. Cl.[3] G01F *1/86***
**U.S. Cl. 73—861.03** **7 Claims**

1. A mass flow sensor comprising a Karman flow detector arranged in a fluid flow path, said flow detector including a vortex generator and a vortex detector generating a detector signal in response to detected periods of generated vortices, and an air density detector including temperature and pressure responsive means for generating a signal proportional to pres-

sures and temperatures of said fluid, said temperature and pressure responsive means comprising an elastic member defining a reference pressure chamber enclosing a standard gas and a comparison pressure chamber into which is introduced said fluid in said fluid flow path, and a rod connected to said elastic member and movable in response to movements of said elastic member, means responsive to a position of said rod to produce an output voltage proportional to said movement of said elastic




member, and means responsive to said output voltage for compensating said vortex detector signal to obtain a fluid density dependent mass flow signal, wherein said fluid density detector and said flow detector have a common width and are aligned with each other on a common longitudinal axis in said fluid flow path, said detector being spaced apart from each other by a distance that is an integral multiple of a distance between successive Karman vortices.

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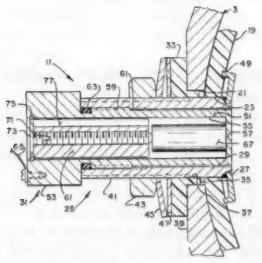
**4,297,895**

## FIELD REPLACEABLE ELECTRODE ASSEMBLY FOR MAGNETIC FLOWMETER

**Felix J. Gryn, Hatfield, Pa., assignor to Emerson Electric Co., St. Louis, Mo.**

**Filed Aug. 9, 1979, Ser. No. 65,167**
**Int. Cl.³ G01F 1/58**
**U.S. Cl. 73—861.12** **6 Claims**



**1.** An electrode assembly for a magnetic flowmeter or the like adapted to be sealably installed on or removed from a meter body or the like, said meter body having a liner on the inside thereof of suitable electrical insulation material and an opening therethrough for accommodating said electrode assembly, said electrode assembly comprising a fitting adapted to be sealably secured to said meter body and to extend outwardly therefrom, said fitting having an axial bore therethrough and an enlarged head on its inner end, said head having a lip projecting therefrom for sealable engagement with said lining all around said head, said lip being so shaped as to conform to the curvature of the portion of the meter body proximate said fitting thereby to prevent rotation of said fitting about its longitudinal axis relative to said meter body, said assembly further comprising spring means for urging said fitting outwardly from said meter body, thereby urging said lip into engagement with said liner, and an electrode adapted to be inserted in and removed from said bore from the exterior of said meter body, said electrode being held within said bore in a sensing position in which it is in sensing relation with fluid flowing through said meter body, and means for sealing said electrode with respect to said fitting.

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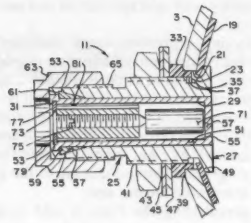
**4,297,896**

## FIELD REPLACEABLE ELECTRODE ASSEMBLY FOR MAGNETIC FLOWMETER

**George H. May, Philadelphia, Pa., assignor to Emerson Electric Co., St. Louis, Mo.**

**Filed Aug. 9, 1979, Ser. No. 65,169**
**Int. Cl.³ G01F 1/58**
**U.S. Cl. 73—861.12** **11 Claims**



**1.** An electrode assembly adapted for a magnetic flowmeter or the like to be sealably installed on or removed from a meter body or the like, said meter body having a liner on the inside thereof of suitable electrical insulation material and an opening therethrough for accommodating said electrode assembly, said electrode assembly comprising a fitting adapted to be sealably secured to said meter body and to extend outwardly therefrom, said fitting having an axial bore therethrough, said assembly further comprising an electrode adapted to be inserted in and removed from said bore from the exterior of said meter body, said electrode being held within said bore in a sensing position in which it is in sensing relation with fluid flowing through said meter body, and means for sealing said electrode with respect to said fitting, said seal comprising a collar slidably received on the exterior of said electrode, said collar having a tapered outer surface, said fitting having a seat engageable with said tapered outer surface of said collar, said electrode having a shoulder engageable with said collar, said electrode assembly further comprising a cap threadably engageable with said fitting and with said electrode for forcing said sealing collar into sealing engagement with said seat and with said electrode and for holding said electrode into said fitting in its sensing position.

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**4,297,897**

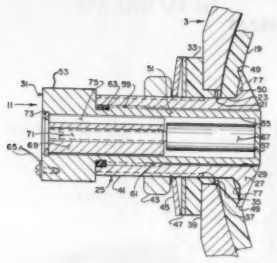
## FIELD REPLACEABLE ELECTRODE ASSEMBLY FOR MAGNETIC FLOWMETER

**James E. Young, Harleysville, Pa., assignor to Emerson Electric Co., St. Louis, Mo.**

**Filed Aug. 9, 1979, Ser. No. 65,170**
**Int. Cl.³ G01F 1/58**
**U.S. Cl. 73—861.12** **6 Claims**

**1.** An electrode assembly adapted to be sealably installed on a meter body or the like, said meter body having a liner on the inside thereof of suitable electrical insulation material and an opening therethrough for accommodating said electrode assembly, said electrode assembly comprising a fitting adapted to be inserted through said opening and to extend outwardly from said meter body, said fitting having an axial bore therethrough, an enlarged head on the end thereof disposed within said meter body, and means for holding said head in sealable engagement with said liner, said assembly further comprising an electrode adapted to be inserted in and removed from said bore from the exterior of said meter body, said electrode being held within said bore in a sensing position in which it is in sensing relation with fluid flowing through said meter body, means for sealing said electrode with respect to said fitting, said head of said fitting and a portion of said electrode in sensing relation with

the fluid flowing through said meter body being so structured as to be self-cleaned by the flow of fluid thereover, said head having a first surface adapted to sealably engage said liner proximate said opening and a second surface facing generally inwardly toward the center of said meter body, said second



surface being generally conical-shaped with the central portion thereof projecting into said meter body more than the outer margins thereof, the portion of said second surface surrounding said bore extending through said fitting and the end of electrode in sensing relation with said fluid being generally coterminous.

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**4,297,898**

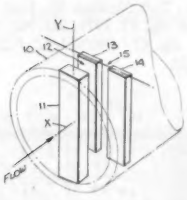
## STABILIZED VORTEX-SHEDDING FLOWMETER

**Peter J. Herzl, Morrisville, Pa., assignor to Fischer & Porter Co., Warminster, Pa.**

**Continuation-in-part of Ser. No. 13,557, Feb. 21, 1979, Pat. No. 4,226,117. This application Dec. 14, 1979, Ser. No. 103,490**

**Int. Cl.³ G01F 1/32**

**U.S. Cl. 73—861.22** **12 Claims**



1. A stabilized vortex-shedding flowmeter comprising:

A. a flow tube through which a fluid stream to be metered is conducted, said tube having a longitudinal flow axis;

B. a front obstacle having a predetermined geometry transversely disposed in said tube to divide the fluid stream therein and to cause vortices to be shed alternately on either edge thereof at a repetition rate proportional to the flow rate of the fluid, thereby producing downstream trains of vortices moving along the right and left sides of the tube;

C. a rear obstacle fixedly supported in the tube behind the front obstacle and mechanically disconnected from the front obstacle to define an unobstructed gap therewith, said rear obstacle being constituted by a pair of parallel relatively broad beams symmetrically disposed with respect to the flow axis and lying in a plane normal thereto, the beams being restrained to remain in a plane transverse to the flow axis, the divided fluid stream, as it flows past the front obstacle, developing a stagnant zone in the gap that is initially aligned with the flow axis; but as vortices are successively detached from the front obstacle and appear alternately on either side of the gap, the low pressure produced by each vortex acts to draw the stagnant zone in front of the beam adjacent thereto, the fluid then going around and past the other beam and imposing a drag force thereon, the drag forces on the beams alternating at a flow rate proportional to flow rate to produce an alternating movement of the stagnant zone that is bi-stable regardless of fading, turbulence and other disturbances; and

D. transducer means for sensing said alternating movement in said tube to produce a corresponding electrical signal.

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**4,297,899**

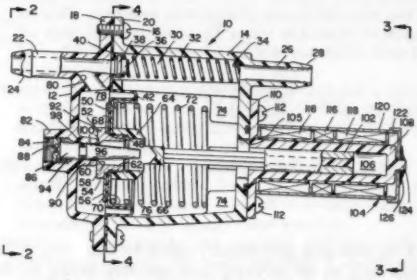
## FLUID FLOW SENSOR

**Peter G. Blaney, Walnut Creek; Dwain D. Conley, Clayton, and Willard L. Zeigner, San Ramon, all of Calif., assignors to Zemco, Inc., San Ramon, Calif.**

**Filed Nov. 23, 1979, Ser. No. 96,830**

**Int. Cl.³ G01F 1/22**

**U.S. Cl. 73—861.58** **4 Claims**



1. A sensor device for measuring the flow rate of fluid through a conduit comprising:

an inlet housing member forming an inlet chamber and having an inlet connection to said conduit;

an outlet housing member forming an outlet chamber and attached to said inlet housing member, said inlet housing member having integral means forming an inlet passage and said outlet housing member having integral means forming an outlet passage which is axially aligned with said inlet passage;

a diaphragm assembly including flexible diaphragm means retained between said inlet and outlet chambers and having a central aperture, said flexible diaphragm means including an annular planar portion around said aperture, an integral circular portion with a U-shaped cross-section around the periphery of said planar portion and an outwardly extending portion integral with said circular portion, located between adjacent flange portions of said housing members, said diaphragm means also including an opening in said outwardly extending portion, said opening having an enlarged sealing lip along its edge and forming a bypass valve seat axially aligned with said inlet passage of said inlet housing;

an adjustable needle valve having a tapered body portion extending into said central aperture to form a relatively small annular opening between said inlet and outlet chambers;

spring means in said outlet housing engaging said diaphragm means and normally urging it toward said needle valve means;

elongated means fixed to and extending from said diaphragm means;

a differential transformer including a magnetic core attached to the end of said elongated means and fixed windings surrounding said core;

means for producing an output signal from said differential transformer proportional to the linear movement of said magnetic core and thus to the movement of said dia-

phragm and the rate of fluid flow through said small opening.

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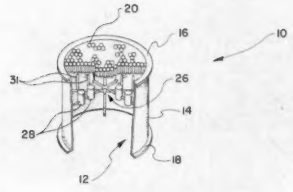
**4,297,900**

## AVERAGING PITOT PRIMARY SYSTEM

**Robert O. Brandt, Jr., Garner, N.C., assignor to Brandt Industries, Inc.**

**Continuation of Ser. No. 954,892, Oct. 26, 1978, abandoned.**
**This application Feb. 25, 1980, Ser. No. 124,340**
**Int. Cl.³ G01F** *1/46*
**U.S. Cl. 73—861.66** **3 Claims**




**1**. An averaging pitot primary system for measuring air flow comprising: an air receiving duct assembly having air flow straightening means incorporated therein; an array of total pressure pitots strategically disposed about the cross sectional area of said air receiving duct assembly adjacent and down stream from said air flow straightening means, each total pressure pitot including an opening parallel with respect to said air receiving duct assembly and wherein the opening within a respective total pressure pitot is of a diameter between 0.030 inches and 0.060 inches; shroud means associated with said total pressure pitots and axially surrounding respective total pressure pitots for minimizing the effects of cross and angular flow; an array of single point static pressure pitots strategically disposed about the cross sectional area of said air receiving duct assembly down stream from said air flow straightening means, and wherein said single point static pitots face the oncoming air flow and includes an opening formed about the side thereof generally perpendicular to the direction of air flow within said duct; manifold means for operatively connecting respective pitots of said total pressure pitot array together, and for connecting respective pitots of said static pressure pitot array together; a differential pressure transmitter including an independent air supply for operating the transmitter operatively connected to said manifold means and further including pitot purge means for continuously purging said pitots by directing a system of air from the transmitter through the respective pitots wherein the back pressure sensed by said transmitter may be used to measure air flow through said air receiving duct assembly; and wherein said manifold means includes a first manifold connecting said static pressure pitots together and a second manifold connecting said total pressure pitots together, and wherein each of said manifolds is connected to a separate input of said transmitter; said first manifold that supports said total pressure pitots comprising at least four generally equally spaced radial sections that project outwardly from a central axis to where they terminate about an outer area of said air receiving duct assembly; and wherein said second manifold also includes at least four generally equally spaced radial sections projeoting likewise from said central axis and which are disposed approximately 45 degrees out of phase with respect to the radial sections of said first manifold.

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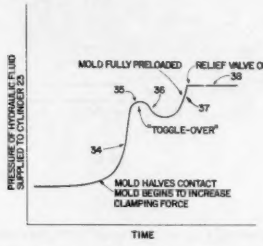
**4,297,901**

## TONNAGE INDICATOR FOR TOGGLE PRESS

**John F. Stroup, Cuyahoga Falls; Leonard P. Nypaver, Westlake, and Dale S. Eberst, Strongsville, all of Ohio, assignors to Van Dorn Company, Strongsville, Ohio**

**Filed May 29, 1980, Ser. No. 154,528**
**Int. Cl.³ G01L** *5/00*
**U.S. Cl. 73—862.53** **21 Claims**




**18**. A method for measuring the final tonnage produced by a press having a toggle mechanism actuated by a closing means, which comprises:

measuring the closing force exerted on the toggle mechanism by the closing means;

detecting an initial peak in the measured closing force;

converting the value of the initial peak in the measured closing force to a final press tonnage value using a proportional relationship.

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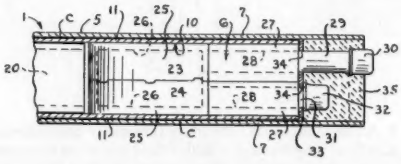
**4,297,902**

## SAMPLER FOR MOLTEN MATERIAL AND A COMPONENT THEREOF

**William J. Collins, 7005 Madison St., Fort Wayne, Ind. 46410**

**Filed Sep. 17, 1979, Ser. No. 75,941**
**Int. Cl.³ G01N** *1/12, 1/20*
**U.S. Cl. 73—863.33** **15 Claims**




**1**. A subassembly for use in obtaining a sample of molten material comprising a pair of mating sections, each of said sections having a recess and a tubular formation, said recesses when said sections are correctly assembled providing a chamber, and said tubular formations serving to respectively accommodate tubular means for the purposes described.

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**4,297,903**

## LIQUID TRANSFER VALVE

**Edmund E. Buzza, Fullerton, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.**

**Filed Apr. 24, 1980, Ser. No. 143,238**
**Int. Cl.³ G01N** *35/08*
**U.S. Cl. 73—864.22** **9 Claims**

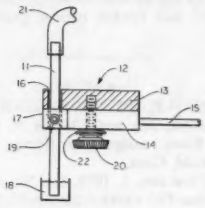
**1**. A liquid transfer valve for use with a probe, said probe being movable relative to said valve in a plane of travel toward and away from said valve, said valve comprising:

a first valve portion including an access port extending through said first valve portion approximately parallel to said plane of travel to allow probe movement there-

through, said first valve portion also including at least one conduit communicating with said access port; and

at least one movable valve portion mounted on said first valve portion for relative movement to a pickup position and a delivery position;

said movable second valve portion including a clearance



hole extending through said movable valve portion approximately parallel to said plane of travel, said clearance hole aligned with said access port in said pickup position to allow probe movement therethrough; and

said movable valve portion further including at least one passageway communicating with said access port in said delivery position.

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**4,297,904**

## GIMBALS

**Donald F. Morton, Welwyn, England, assignor to British Aerospace Public Limited Company, London, England**

**PCT No. PCT/GB79/00089, § 371 Date Jan. 31, 1980, § 102(e) Date Jan. 2, 1980, PCT Pub. No. WO79/01161, PCT Pub. Date Dec. 27, 1979**

**PCT Filed May 30, 1979, Ser. No. 189,834**

**Claims priority, application United Kingdom, May 31, 1978, 25711/78**

**Int. Cl.³ G01C *19/22*; F16C *11/12***

**U.S. Cl. 74—5 F** **6 Claims**

**1**. A gimbal assembly for carrying a rotor for spin about a z axis includes an inner member, an outer member, first and second frame members situated between the inner and outer members, first outer pivot means pivoting the first frame member to the outer member about a y axis, second outer pivot means pivoting the second frame member to the outer member about an x axis, first inner pivot means pivoting the second frame member to the inner member about the y axis, second inner pivot means pivoting the first frame member to the inner member about the x axis, the first frame member comprising a continuous periphery having opposed regions at the y axis outwardly directed from the z axis on which the first outer pivot means are carried, further opposed regions at the x axis inwardly directed toward the z axis on which the second inner pivot means are carried, and bridging regions joining the outwardly and inwardly directed regions, the second frame member comprising a continuous periphery identical to that of the first frame member having opposed regions at the x axis outwardly directed from the z axis on which the second outer pivot means are carried, further opposed regions at the y axis inwardly directed toward the z axis on which the first inner pivot means are carried, and bridging regions joining the outwardly and inwardly directed regions, successive bridging regions of one frame member being formed to alternately cross over and cross under the bridging regions of the identically formed other frame member so that the frame members are interlaced.

**4**. A method of forming a gimbal assembly as defined in claim **1** from a billet of solid material with parallel end faces, including the not necessarily sequential steps of:

forming between the end faces four identical inwardly extending bores two along the y axis and two along the x axis to accept the first and second pivot means respectively,

forming between the end faces four identical wedge shaped inwardly extending slots equally spaced between and in the same plane as the x and y axes of a depth to leave a boss of solid material on the z axis to eventually form the inner member,

forming an outer annular slot co-axially with the z axis to eventually separate the outer member from the frame members, fillets of material being left to hold the partly formed billet rigidly in one piece,

forming from the outer annular slot four identical slots inwardly extending toward the z axis equally spaced between the x and y axes of a length to provide clearance between the first and second frame members,

forming an inner annular slot co-axially with the z axis to eventually separate the frame members from the inner member, fillets of material being left to hold the partly formed billet rigidly in one piece,

forming four identical inner apertures on a common radius from the z axis, two lying on the x axis and two on the y axis to provide access to inner regions of the pivot means after insertion in their bores,

forming four identical outer apertures on a common radius from the z axis, two lying on the x axis and two on the y axis to provide access to outer regions of the pivot means after insertion in their bores,

forming an intermediate annular slot between the inner and outer annular slots, again co-axially with the z axis, the intermediate slot being in four identical segments two being equally spaced about the x axis and two being equally spaced about the y axis to provide eventual separation between the inwardly and outwardly directed regions of the first and second frame members,

inserting and anchoring pivot means in the four bores to provide pivots between the inner member and the frame members and between the outer member and the frame members, and,

removing the fillets of solid material to release the frame members from one another and from the outer and inner members.

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**4,297,905**

## GYROSCOPIC VERTICAL REFERENCE SYSTEM

**Ruben Hadek[illegible], 4 Lalor St., London SW6 5SR, England**

**Filed Sep. 13, 1979, Ser. No. 75,121**

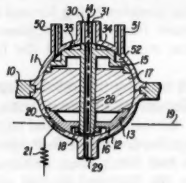
**Claims priority, application United Kingdom, Oct. 5, 1978, 39371/78**

**Int. Cl.³ G01C *19/12, 19/20, 19/52***

**U.S. Cl. 74—5.43** **4 Claims**

**1**. A gyroscopic vertical reference system comprising a rotor of substantially spherical shape driven and supported by air pressure and revolving about a vertical spin axis in a stator formed as a hollow spherical chamber, said chamber being rigidly mounted on a gimballed platform, said rotor being formed with a hole through its spin axis, said hole being fed with pressure air at one end and the opposite end being sur-

rounded with a groove in the rotor leaving a small land between said groove and said hole, the groove communicating with atmosphere, and the hole and groove cooperating with ports in the stator to create pressure differences corresponding to a displacement between rotor and stator representing a



deviation of the rotor spin axis from the perpendicular to the platform, said pressure differences being fed to pneumatic actuators in a sense enabling these actuators to drive said platform in a direction which annuls the displacement and restore the perpendicularity of the platform to the spin axis.

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**4,297,906**

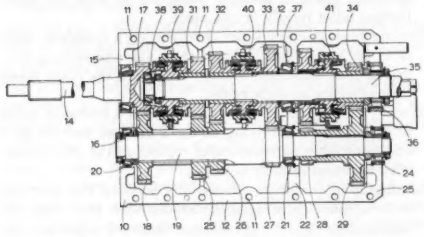
**GEAR BOX**

**Kenneth Costello, 7 Aldwick Close, London S.E.9, England**

**Continuation of Ser. No. 838,013, Sep. 29, 1977, abandoned. This application Oct. 22, 1979, Ser. No. 87,176**

**Int. Cl.³ F16H** *57/00, 3/08, 57/02*

**U.S. Cl. 74—410** **8 Claims**



**1**. A gear box comprising:

a gear box casing;

input shaft means for receiving drive whereby to cause said shaft means to rotate in a predetermined direction;

first mounting means to mount said input shaft means in said casing;

a first helical input gear means mounted on said input shaft to rotate therewith;

a lay shaft means;

a second helical gear means fixedly mounted to said lay shaft means and positioned to engage with said helical input gear means to be rotated thereby;

further helical gear means fixedly mounted to said lay shaft means;

main shaft means;

second mounting means to mount said shaft means in said casing coaxially with said input shaft means;

thrust bearing means mounted between adjacent ends of said input and main shaft means;

output helical gear means mounted on said main shaft means to selectively rotate therewith and adapted to engage with said further helical gear means to drive said main shaft;

the helices of the first helical input gear means and the output helical gear means being such that when the input shaft means is driven in said predetermined direction the input and main shaft means are thrust towards one another, said thrust being absorbed in said thrust bearing means;

and the helices on said second helical gear means and said further helical gear means being such that when the input shaft means is driven in said predetermined direction the second helical gear means and said further helical gear means are thrust apart from one another, said thrust being absorbed by the lay shaft to which said second helical gear means and said further helical gear means are fixedly mounted.

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**4,297,907**

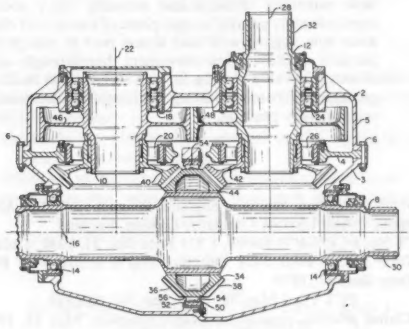
**TORQUE SPLITTING GEAR DRIVE**

**Robert B. Bossler, Jr., and Charles P. Hardersen, both of Bloomfield, Conn., assignors to Kaman Aerospace Corporation, Bloomfield, Conn.**

**Filed Jun. 1, 1979, Ser. No. 44,492**

**Int. Cl.³ F16H** *1/20, 35/06, 57/00*

**U.S. Cl. 74—417** **15 Claims**



**1**. A torque splitting gear drive having a frame, first second and third shafts supported for rotation relative to said frame about first, second and third axes respectively, first and second gears carried by said first shaft and movable in unison along said first axis, two intermediate gears each fixed to a respective one of said second and third shafts and each meshing with a respective one of said first and second gears, and other gear means drivingly connecting said second and third shafts and compelling said second and third shafts to rotate in unison, further characterized by said first and second gears both being part of a torque distributing member carried by but separate from said first shaft, means connecting said member to said first shaft whereby it is constrained to rotate with and is free to move axially relative to said first shaft, and a bearing supported by said frame and surrounding and engaging said member along an axial portion thereof to rotatably support it for rotation relative to said frame about said first axis and to permit it to move axially relative to said frame and to said first shaft.

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**4,297,908**

**LEVERAGE SYSTEM**

**Ernst Zimmer, Friedberg, Fed. Rep. of Germany, assignor to Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft, Augsburg, Fed. Rep. of Germany**

**Filed Sep. 19, 1979, Ser. No. 76,920**

**Claims priority, application Fed. Rep. of Germany, Sep. 22, 1978, 2841183**

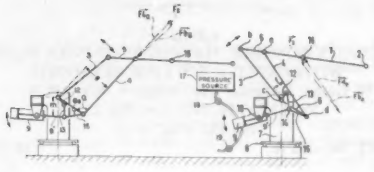
**Int. Cl.³ G05G** *1/04;* **F16H** *21/44*

**U.S. Cl. 74—469** **5 Claims**

**1**. In a leverage system comprising: a support; a four-member articulated linkage pivotally secured to said support; a load arm rigid with one of the members of said linkage; a gripper on said load arm spaced from said linkage; and a weight-compensating assembly connected to said linkage for counterbalancing gravitational forces on said leverage system to maintain same

stationary in a plurality of configurations, said linkage having a plurality of pivots;

the improvement wherein said weight-compensating assembly includes a force applicator pivotally fixed to said support, a first bar element pivotally secured to said applicator and to a pivot of said linkage, and a second bar



element pivotally secured to one end to said applicator and said first bar element and at an opposite end to a member of said linkage, whereby said first and second bar elements coact in transmitting force from said applicator to said linkage and in pivoting said applicator to vary the direction of force application in accordance with the configuration of said linkage.

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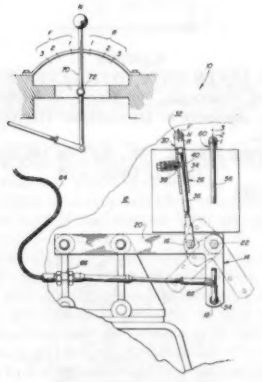
**4,297,909**

## TRANSMISSION SHIFT CONTROL LINKAGE FOR CONTROLLING BOTH SPEED AND DIRECTION CHANGES WITH ONE INPUT MOTION

**Stephen K. Crouse, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.**

**Filed Dec. 14, 1979, Ser. No. 103,497**
**Int. Cl.³ G05G 9/00**
**U.S. Cl. 74—473 R** **8 Claims**



1. In a control, for a hydraulically controlled transmission, including a direction selector valve shiftable in opposite directions from a neutral position respectively to forward and reverse drive-effecting positions, and a speed selector valve shiftable in a first direction from a first speed-effecting position to various serially arranged positions for effecting increasing speeds, an improved linkage for controlling the shifting of the direction and speed selector valves, comprising: an input link mounted for pivotal movement about a fixed axis among a centered neutral position and various forward and reverse speed positions respectively located in first and second directions from the last-named neutral position; a first output link pivotally interconnected between the input link and the direction selector valve; a second output link interconnected between the input link and the speed selector valve and located on the input link and the speed selector valve such that a line extending through the connections of the second output link with the input link and speed selector valve, when the input link is in its neutral position, intersects said axis; the respective connections of the first and second output links with the input link being such that respective lines joining the connections with the axis define an included angle of about 90°.

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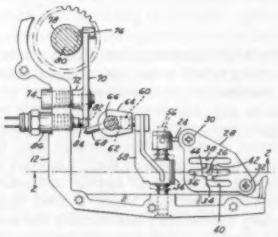
**4,297,910**

## TRANSMISSION GEAR SELECTOR CONTROL

**Richard A. Myers, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.**

**Filed Sep. 17, 1979, Ser. No. 76,117**
**Int. Cl.³ G05G 9/12, 5/02**
**U.S. Cl. 74—473 R** **1 Claim**



1. A transmission gear selector for controlling movement of a gear shift mechanism comprising:

a gear selector shaft mounted for rotation and axial displacement;

a selector pin fixed to the selector shaft extending outwardly therefrom;

a first control block fixed to the selector shaft;

a guide rail mounted for rotation about and axial displacement along an axis that extends transversely with respect to the selector shaft;

a second control block fixed to the guide rail;

a first bellcrank mounted for rotation about and axial displacement along an axis that extends transversely with respect to the selector shaft having one arm engaged in the first control block and a second arm engaged in the second control block, whereby axial movement and rotation of the selector shaft produce, respectively, axial movement and rotation of the guide rail;

guide means defining paths of selector shaft movement within which means the selector pin is fitted to control the movement of the selector shaft and the guide rail;

an engagement pin fixed to the guide rail and extending outwardly therefrom;

a second bellcrank mounted for pivotal movement having one arm engageable by the engagement pin upon rotation of the guide rail, the pivotal movement of the second bellcrank resulting from axial movement of the guide rail; and

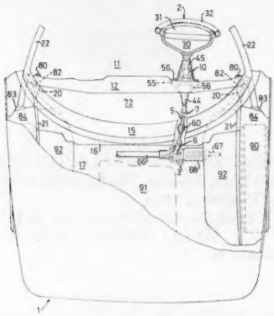
a gear journalled on an idler shaft that extends substantially parallel to the axis of the guide rail and movable axially on the idler shaft in response to pivotal movement of the second bellcrank.

**4,297,911**

## STEERING EQUIPMENT ARRANGEMENT FOR MOTOR VEHICLES

**Sven-Ake Grahn; Magnus A. Roland, and Carl L. Eriksson, all of Trollhättan, Sweden, assignors to Saab-Scania Aktiebolag, Sodertalje, Sweden**

**Filed Dec. 11, 1978, Ser. No. 967,979**
**Claims priority, application Sweden, Dec. 12, 1977, 7714050**
**Int. Cl.³ B62D 1/18**
**U.S. Cl. 280—777** **8 Claims**



**1**. A safety steering arrangement for a motor vehicle comprising a steering wheel; a steering column fixed to the steering wheel; an intermediate shaft connecting said steering column with a steering gear and having a deformable portion, which allows compression and/or deflecton of the intermediate shaft under the action of an exceptional impact force from the steering gear side of the intermediate shaft; a column support carrying the steering column and having deformation initiation areas, a vehicle windscreen beam; a cowl panel; a support beam extending substantially horizontally and transversely at a location rearwardly of and separate from the vehicle windscreen beam and cowl panel and fixed in carrying portions of the vehicle body sides, said support beam being positioned in front of said deformation initiation areas of said column support and having a surface facing the steering wheel and supporting the column support when said deformation areas are deformed under the action of an exceptional impact force from the steering wheel side of the steering column.

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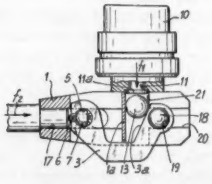
**4,297,912**

## CONTROL DEVICES FOR USE WITH A SHEATHED WIRE OR CABLE

**Robert Marechal, Paris, France, assignor to Société Anonyme SICMA - Société Industrielle and Commerciale de Matériel Aeronautique, both of Issoudun, France**

**Filed Feb. 21, 1979, Ser. No. 13,074**
**Claims priority, application France, Feb. 22, 1978, 78 05785**
**Int. Cl.³ F16C 1/10**
**U.S. Cl. 74—501 R** **6 Claims**



**1**. A control device comprising a housing, a traction element slidable in the housing, said traction element being securable to an elongate control element, and said traction element having means defining an inclined surface, ball means cooperating with said inclined surface, and pushbutton means slidable in the housing and actuatable to cause the traction element to be displaced by interaction between the ball means and said inclined surface, said housing including means defining an internal partition, said traction element being generally U-shaped and comprising opposed limbs, said limbs being located on opposite sides of said internal partition.

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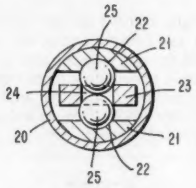
**4,297,913**

## REMOTE CONTROL HAVING PUSH-PULL BLADE WITH CAPTIVE ROLLING ELEMENTS

**Paul W. Garbo, 48 Lester Ave., Freeport, N.Y. 11520**

**Filed Mar. 29, 1979, Ser. No. 25,008**
**Int. Cl.³ F16C 1/10**
**U.S. Cl. 74—501 R** **16 Claims**



**1**. A remote control comprising a tubular sheath, a flexible push-pull blade extending longitudinally through said sheath and having a series of spaced openings disposed along the longitudinal center line of said blade, at least one rolling element seated in each of the opposite ends of each of said openings, each of said openings being dimensioned so that the opposed rolling elements in each of said openings are in contact with each other but are prevented from passing therethrough.

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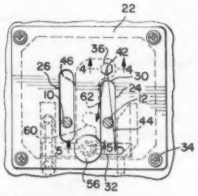
**4,297,914**

## CONTROL LEVER GATE WITH LEVER RESTRAINT

**John E. Klem, Waukegan, and Daniel E. Nelson, Wildwood, both of Ill., assignors to International Harvester Company, Chicago, Ill.**

**Filed May 12, 1980, Ser. No. 148,632**
**Int. Cl.³ G05G 5/06**
**U.S. Cl. 74—532** **7 Claims**



**1**. In a vehicle having a control leve[illegible]pable of being moved in fore and aft directions and including a neutral location, a lever restraint for restraining said control lever in said neutral position comprising:

a rigid cover plate provided with an elongated slot for accommodating said control lever in the range of said control lever fore and aft directions, a transverse arcuate slot at an end of said elongated slot, a bore through said rigid cover plate located adjacent said slot at the upper end thereof opposite said transverse arcuate slot;

a bolt and nut fastener positioned in said bore of said rigid cover plate defining an arcuate center point;

a pivotable plate pivotally attached to the back side of said

rigid cover plate by said bolt and nut fastener, said pivotable plate being generally "L" shaped and provided with an upper aperture in an end of a short leg of said "L" shape and a threaded lower aperture in the end of a long leg of said "L" shape, and a trap slot in a mid-section of said long leg of said "L" shape pivotable plate;

a bushing carried in said upper aperture of said pivotable plate, said bushing having a length greater than the width of said pivotable plate;

a security knob having a threaded stud passing through said rigid cover plate and threaded into said threaded lower aperture of said pivotable plate whereby said pivotable plate may be pivoted around said bolt and said control lever, when in the neutral position, will be trapped in said trap slot of said pivotable plate and whereby tightening of said security knob will prevent movement of said pivotable plate.

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**4,297,915**

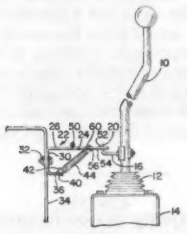
## POSITIVE LEVER LOCATION MAINTENANCE TRAP

**John E. Klem, Waukegan, Ill., assignor to International Harvester Company, Chicago, Ill.**

**Filed May 12, 1980, Ser. No. 148,648**

**Int. Cl.³ G05G 5/06**

**U.S. Cl. 74—532** **5 Claims**




1. In a vehicle having a hydraulic working circuit and a control for adjusting flow through said circuit, the improvement comprising:

a control lever operable in a fore and aft vertical plane having a bore provided therethrough transverse to the longitudinal axis of said control lever;

a rod having an upwardly extending end portion positioned into said bore of said control lever and projecting forwardly from said control lever;

a hinged plate having a mounting plate surface and a stationary leaf extending from said mounting plate surface toward said control lever, said stationary leaf having an edge, a movable leaf connected to said stationary leaf through a hinged pin on said stationary leaf, said movable leaf having an aperture therethrough of a diameter large enough to accommodate said rod and an appendage provided with an aperture therethrough;

a projecting tab extending forward from said mounting plate surface toward said control lever, said projecting tab having an aperture located through said tab and being outboard of a vertical plane corresponding to said edge of said stationary leaf, said aperture of said projecting tab aligned in the same vertical plane as said aperture in said appendage of said movable leaf;

a spring having a first mounting eye connected through said aperture of said projecting tab and a second mounting eye connected through said aperture of said appendage of said movable leaf;

a contact surface integral with said stationary leaf adjacent said hinged pin on a lower side thereof and a second contact surface integral with said movable leaf adjacent said hinged pin on the lower side thereof, said first and second contact surfaces in contact with each other when said movable leaf is urged to a position whereby said rod is engaged in said aperture of said movable leaf.

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**4,297,916**

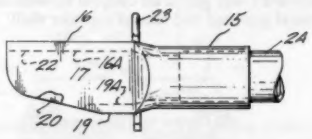
## CHAIN TIGHTENER ATTACHMENT

**Elvin O. Burroughs, 81650 Lost Creek Rd., Dexter, Oreg. 97431**

**Continuation-in-part of Ser. No. 824,857, Aug. 15, 1977, abandoned. This application Jan. 29, 1979, Ser. No. 7,771**

**Int. Cl.³ G05G 1/00**

**U.S. Cl. 74—544** **2 Claims**




1. In an attachment for temporary axial engagement with a pivoted handle of a chain tightener, said attachment increasing leverage of the handle during tightening and loosening of a flexible member coupled to the tightener and extending about a load, said attachment including an elongate rigid member for endwise reception of the chain tightener handle during tightening of the flexible member, said attachment further including a pair of opposed sidewalls disposed at one end of said member and a truncated wall having an opening therein and contiguous with said sidewalls and terminating remotely inwardly from outer extremities of said opposed sidewalls to define an open area, the improvement comprising,

a continuous wall extending lengthwise the length of said sidewalls in overlapping relationship with said truncated wall and interconnecting said sidewalls, said continuous wall being substantially perpendicular to the sidewalls and having an inwardly disposed continuous surface along and against which the end of the tightener handle may slide during rapid pivotal handle movement encountered during a tightener releasing operation whereby a segment of said handle moves through said open area while the handle end forcefully displaces the attachment in a lateral direction.

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**4,297,917**

## POWER DISTRIBUTION GEARING FOR DOUBLE HELIX EXTRUDERS

**Erwin Bauer, Weinstadt; Ralf Davids, Illingen; Gerhard Gotz, Ludwigsburg; Hilmar Jussen, Marbach; Heinrich Arndt, Augsburg; Louis Kummel, Stadtbergen; Rudolf Morhart, and Erich Pollak-Banda, both of Augsburg, all of Fed. Rep. of Germany, assignors to Werner & Pfleiderer, Stuttgart and Zahnraderfabrik Renk Aktiengesellschaft, Augsburg, both of, Fed. Rep. of Germany**

**Filed Sep. 18, 1979, Ser. No. 76,606**

**Claims priority, application Fed. Rep. of Germany, Sep. 27, 1978, 2841985**

**Int. Cl.³ F16H 37/06**

**U.S. Cl. 74—665 G** **5 Claims**

1. A drive gear assembly for the synchronous rotation of the shafts of a double helix extruder, said gear assembly comprising:

a housing;

a first power transmission path mounted to said housing comprising gear reduction means for driving a distribution gear;

a first double joint toothed coupling shaft engaged with said distribution gear;

a second double joint toothed coupling shaft engaged with said distribution gear;

a frontal central gear engaging said first toothed coupling shaft;

a rearward central gear engaging said second toothed coupling shaft;

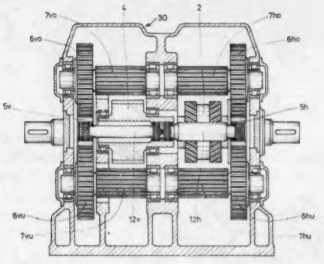
a first extruder helix shaft extending into said housing and being rotatably disposed with respect to said housing;

a second extruder helix shaft extending into said housing and being rotatably disposed with respect to said housing;

a frontal lower gear train coupled between said frontal central gear and said first extruder shaft;

a frontal upper gear train coupled between said frontal central gear and said first extruder shaft;

a rearward lower gear train coupled between said rearward central gear and said second extruder shaft;



a rearward upper gear train coupled between said rearward central gear and said second extruder shaft;

each said gear train including a tumbler-born intermediary gear;

said frontal central gear being unsupported in said housing and lying in the plane of the axes of the gears to which it engages in both of said frontal upper and lower gear trains; and

said rearward central gear being unsupported in said housing and lying the plane of the axes of the gears to which it engages in both of said rearward upper and lower gear trains.

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**4,297,918**

## CONTROL SYSTEMS FOR STEPLESSLY-VARIABLE RATIO TRANSMISSIONS

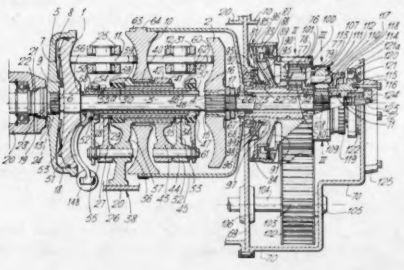
**Forbes G. deB. Perry, Forest Row, England, assignor to National Research Development Corporation, London, England**

**Filed Jun. 21, 1979, Ser. No. 50,745**

**Claims priority, application United Kingdom, Jun. 23, 1978, 27744/78**

**Int. Cl.³ F16H** *37/06, 15/00, 13/00*

**U.S. Cl. 74—690** **6 Claims**



**1.** A control system for a steplessly variable ratio transmission unit of the type having an input disc and an output disc which have facing surfaces forming part of a torus and which are mounted for rotation about a common main axis, there being at least one roller in driving engagement with the toroidal surfaces of the discs, the or each roller having a mounting permitting it to swivel about a ratio change axis substantially tangential to the centre circle of the torus of which the surfaces of the discs form part, whereby the speed ratio between the input and the output disc may be changed, the roller mounting also permitting limited bodily translation of the roller substantially along the line of the ratio change axis whereby a change in the said ratio is initiated, any translational position of the roller mounting along this line having a corresponding equilibrium ratio, the transmission unit comprising also a ratio actuator coupled to the roller mountings opposing the driving torque reaction of the rollers, an end-load actuator urging the discs together into driving engagement with the or each roller, a source of pressurised fluid for the ratio actuator and the end-load actuator, the control system comprising a ratio control valve which valve is operable to control the fluid pressure from the source to a required extent to produce a required ratio by means of the ratio actuator and a corresponding end-load on the discs by means of the end-load actuator the control system further comprising end-stop valve means operable, via a mechanical connection, by the ratio actuator at or near to one end at least of its permissible stroke, to constrict the fluid connection to the ratio control valve so that the pressure from the source is no longer solely under control of the ratio control valve and rises up-stream of the end-stop valve meaans, which comprises a cylinder space and a movable member the fluid pressure from the source being introduced into the cylinder space, the rising pressure on operation of the end-stop valve means, acting in the said cylinder space upon a piston face of the movable member in a sense urging the ratio actuator away from the end of its stroke, the end-load actuator being connected to the pressurised fluid source up-stream of the end-stop valve means.

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**4,297,919**

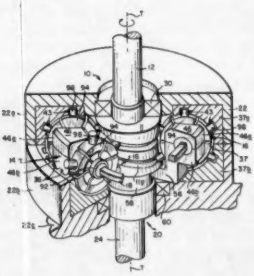
## MECHANICAL POWER TRANSMISSION METHOD AND MEANS

**Manfred R. Kuehnle, 6 Linmoor Ter., Lexington, Mass. 02173**

**Filed Apr. 19, 1979, Ser. No. 31,469**

**Int. Cl.³ F16H** *3/44, 1/18*

**U.S. Cl. 74—750 R** **18 Claims**



**1.** A mechanical transmission of the type including one or more helix-like races defining a plurality of race convolutions having a common axis of rotation, a support member extending along the axis, at least one bearing unit axially fixed to the support member and with its periphery positioned in rolling engagement with the race convolutions, and means for rotating each bearing unit about said axis whereby each bearing unit rolls along the race convolutions and the support member advances along said axis, the improvement wherein each bearing unit comprises

A. a hub,

B. a circular array of tooth means located radially outward

from the hub, each tooth means engaging in a different race convolution, and

C. means for connecting each tooth means to the hub so that each tooth means is resiliently displaceable independently of the other tooth means in the direction along said axis of rotation, but not circumferentially around the hub so that when the transmission is placed under load, each tooth is displaced in said direction as necessary to distribute said load uniformly among all the bearing units.

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**4,297,920**

## CYCLOIDIC GEAR

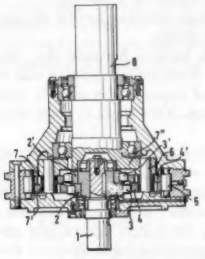
**Hans Richter, Oberlanderstrasse 123, D-8900 Augsburg, Fed. Rep. of Germany**

**Filed Jul. 5, 1979, Ser. No. 55,131**

**Claims priority, application Fed. Rep. of Germany, Jul. 13, 1978, 2830909**

**Int. Cl.³ F16H** *1/28, 35/00*

**U.S. Cl. 74—804** **1 Claim**



**1.** In a cycloid gear of the type comprising a drive shaft, a pair of eccentric disks connected to said drive shaft and displaced by 180° from one another, a pair of curved disks disposed around said pair of eccentric disks respectively, said curved disks respectively having outer peripheries of cyclodic curved shape which roll off along a plurality of rollers that are in engagement with said outer peripheries and that are disposed in an array concentric with said drive shaft, each of said curved disks having a plurality of boreholes therein disposed in a ring shaped array, the boreholes in said curved disks respectively overlapping one another in pairs to define an effective axially directed opening through each pair of overlapping boreholes, an output shaft, and a plurality of axially directed bolts extending through said effective axially directed openings respectively and connected to said output shaft for driving said output shaft as said input shaft, said eccentric disks and said curved disks rotate, the improvement wherein said effective axially directed openings have a predetermined minimum dimension in a direction transverse to said shafts, each of said bolts having resilient carrier roller means thereon comprising a bush surrounding its associated bolt, a tubular sleeve of resilient material surrounding said bush, and a deformable tubular metal casing surrounding said resilient sleeve, the outside diameter of said tubular metal casing being the outside diameter of said carrier roller means, and the unstressed outside diameter of said carrier roller means being greater that the said predetermined minimum dimension of the axially directed opening through which said resilient carrier roller means passes, whereby all of said resilient carrier roller means are in continual resiliently compressed engagement with the opposing portions of the overlapping boreholes which define the effective axially directed openings through which said resilient carrier roller means pass respectively and operate, by reason of the compression of said resilient carrier roller means, to preload said gear.

**4,297,921**

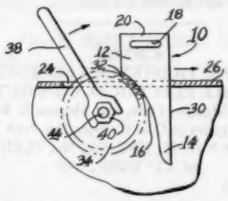
## CIRCULAR SAW BLADE REMOVING COMBINATION

**Wally Wydra, 723 N. Walnut, Itasca, Ill. 60143**

**Filed Aug. 10, 1979, Ser. No. 65,610**

**Int. Cl.³ B23D** *57/00;* **B25B** *11/00*

**U.S. Cl. 81—3 R** **7 Claims**




**1.** In combination: a support surface having a slot formed therein to enable a circular saw blade to extend therethrough; shaft means for receiving said circular saw blade in alignment with the slot in said support surface; locking means removably secured to said shaft means for securing said circular saw blade to said shaft means; a main body portion and a nose portion extending therefrom to form a tool; a circular-blade engaging portion formed on said nose portion, said nose portion insertable into said slot to have said circular-blade engaging portion urged against said circular saw blade for holding said blade against rotation; whereby said locking means is easily removed from said shaft to facilitate removal of said circular saw blade.

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**4,297,922**

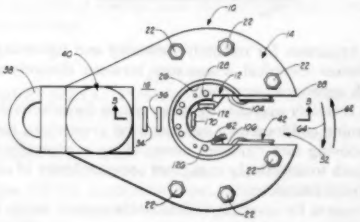
## JAW SUPPORT FOR A POWER TONGS

**Charles O. Higdon, 601 Howard Dr., Del City, Okla. 73115**

**Filed Apr. 16, 1980, Ser. No. 140,837**

**Int. Cl.³ B25B** *17/00*

**U.S. Cl. 81—57.18** **6 Claims**



**1.** In a power tongs of the type having a rotatable rotor mounted on a case for rotation in first and second driven directions, said rotor having a central aperture for receiving a pipe to be turned and said rotor supporting a detachable jaw via a jaw support rotatably mounted on the rotor, and said power tongs including an actuating assembly for positioning the jaw to alternatively grip and release the pipe in response to a limited relative rotation between the rotor and the jaw support, wherein the rotor is characterized as having opposed end walls having a plurality of roller mounting holes formed therethrough, each of the roller mounting holes in one end wall of the rotor aligned with a roller mounting hole in the other end wall, and wherein the actuating assembly comprises a plurality of rollers each supported within the rotor via a roller pin inserted through a pair of aligned holes formed in opposite end walls of the rotor and extending therebetween, the improvement wherein the jaw support comprises:

a first support plate mounted flush against one of the end walls of the rotor;

a second support plate mounted flush against the other end wall of the rotor; and

means connecting the first support plate to the second support plate; and

wherein each of the support plates is characterized as having a generally arcuate form of an extent sufficient to overlay the roller mounting holes within the limited range of rotation of the jaw support on the rotor utilized for positioning the jaw to alternatively grip and release the pipe.

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**4,297,923**

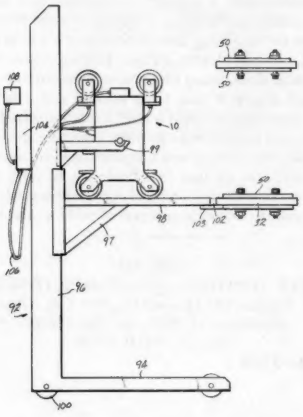
## AUTOMATIC TIGHTENER/LOOSENER FOR INTERCELL ELECTRICAL CONNECTORS

**Steven J. Specht, Mentor, Ohio, and Morton S. Kircher, Clearwater, Fla., assignors to Olin Corporation, New Haven, Conn.**

**Filed Nov. 13, 1976, Ser. No. 93,425**

**Int. Cl.³ B25B *21/02***

**U.S. Cl. 81—57.41** **14 Claims**



1. Apparatus for remotely loosening and tightening upper and lower electrical connectors between electrolytic cells, which apparatus comprises:

(a) remotely operable tightener means for selectively tightening and loosening said electrical connectors, means for moving said tightener means along a generally vertical path to selectively engage an upper or lower of said electrical connectors;

(b) means for inverting said movable support means thereby inverting said tightener means;

(c) moveable support means for supporting said tightener means and for moving said tightener means along a generally horizontal path to align said tightener means with said upper or lower electrical connectors along said generally vertical path before said tightener means is moved along said generally vertical path to engage said electrical connectors for loosening or tightening;

(d) guide means fastened to said movable support means and contactable with said electrical connectors for guiding said support means along a predetermined path of travel between said cells, said path including at least one predetermined location at which said tightener means is operable to loosen and tighten said electrical connector;

(e) locator means connected to said movable support means for locating said support means at said predetermined location along said path; and

(f) control means connected to said movable support means for remotely controlling the operation of said tightener means when said tightener means is located at said predetermined location, whereby said electrical connector is selectively and remotely tightened and loosened.

**4,297,924**

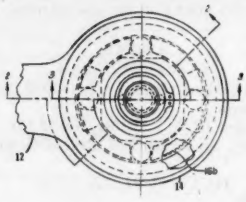
## RATCHET WRENCH

**Leonard W. Stephens, Fairview, Pa., assignor to Perry M. Lane, Washington, Pa.**

**Filed May 13, 1980, Ser. No. 149,462**

**Int. Cl.³ F16D *41/08***

**U.S. Cl. 81—59.1** **21 Claims**



1. A clutch comprising a shank,

a rotatable body member having an inner annular surface around the shank,

arcuate shoes located between the shank and said inner surface for frictionally engaging said inner surface,

rollers located between the arcuate shoes and engageable with the ends of the shoes to press them against said inner surface,

a rigid positioning member movable in one direction to engage the shoes and hold first ends of the shoes against the rollers and the rollers against the shank whereby when the body member is rotated in said one direction the shoes are held by the rollers against said inner surface and the rollers engaging the shank force the shank to rotate in said one direction but when the body member is rotated in the opposite direction the shoes can slide on said inner surface,

the rigid positioning member being movable in said opposite direction to engage the shoes and hold second ends of the shoes against the rollers and the rollers against the shank whereby whereby when the body member is rotated in said opposite direction the shoes are held by the rollers against said inner surface and the rollers engaging the shank force the shank to rotate in said opposite direction but when the body member is rotated in said one direction the shoes can slide on said inner surface,

and actuating means having spring means engageable with the rigid positioning member to press it to its shoe engaging positions, said shoes having symmetrical upper and lower surfaces either of which may be top or bottom and further having symmetrical ends either of which may be said first end or said second end.

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**4,297,925**

## TURRET HEAD FOR A LATHE

**Shinichi Ishizuka, and Kenji Sugimoto, both of c/o Citizen Watch Company Limited, No. 1-12, 6-chome, Hon-cho, Tanashi-shi, Tokyo, Japan**

**Filed Apr. 12, 1979, Ser. No. 29,556**

**Claims priority, application Japan, Jul. 15, 1978, 53/85677; Jul. 15, 1978, 53/85678**

**Int. Cl.³ B23B *29/32***

**U.S. Cl. 82—2 R** **3 Claims**

1. In a numerically controlled automatic lathe of the sliding headstock type comprising a spindle for supporting a workpiece and having a central axis, the improvement comprising:

a turret head including a bore and having a first group of polygonal surfaces each oriented in one direction and a second group of polygonal surfaces each extending from the edge of each of said first group of polygonal surfaces and oriented in another direction substantially perpendic-

ular to said each of said first group of said polygonal surfaces;

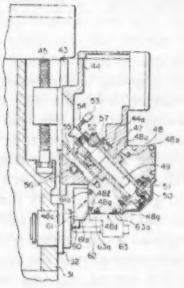
said first group of said polygonal surfaces serving as means for mounting a first plurality of tool means for performing outside machining operation;

said second group of polygonal surfaces serving as means for mounting a second plurality of tool means for performing inside machining operation;

a saddle movable in a direction perpendicular to the central axis of said spindle and having a sliding surface facing said turret head;

a hollow support shaft fixedly supported by said saddle and extending from the sliding surface of said saddle, such that its axis intersects the central axis of said spindle at a predetermined axis, said hollow support shaft including a portion slidably engaging the bore of said turret head to rotatably support said turret head;

a turret head drive shaft disposed in and rotatably supported by said hollow support shaft, said turret head drive shaft having its end fixedly coupled to said turret head to cause said turret head to rotate around said hollow support shaft to index said turret head so as to bring ones of said first and second groups of polygonal surfaces to a working location in which said one of said first group of polygonal surfaces is substantially perpendicular to said central axis



of said spindle and said one of said second group of polygonal surfaces is parallel to said central axis of said spindle;

said saddle having a cylinder including a chamber;

a piston member provided in said chamber at the end portion of said support shaft member;

a transmission disc member connected to the end of said turret head drive shaft member and fixed at its circumferential portion to said turret head;

gear means fixed to the other end of said turret head drive shaft member;

said piston acting on the end portion of said drive shaft to urge said turret head against the sliding surface of said saddle by a force transmitted from said piston through said gear means, said drive shaft and said transmission disc member;

said turret head having a plurality of positioning hole means;

said sliding surface being perpendicular to said axis of said support shaft member; and

a positioning member supported by said saddle and caused to protrude in one of said positioning hole means while at the same time said chamber of said saddle is supplied with a pressurized oil whereby said turret head is retained in a fixed position relative to said saddle by the action of said positioning member and the pressurized oil acting on said turret head through said piston, said drive shaft and said transmission disc member.

**4,297,926**

## MACHINE TOOL WITH OFFSET COMPENSATION

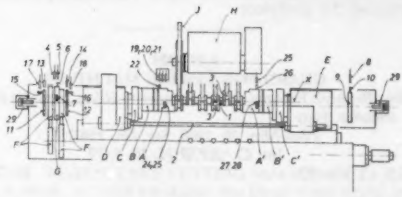
**Peter Russ, Monheim, and Heinz Jansen, Cologne, both of Fed. Rep. of Germany, assignors to Deutsche Industrieanlagen GmbH Werk Hermann Kolb Maschinenfabrik Koeln, Cologne, Fed. Rep. of Germany**

**Filed Mar. 6, 1980, Ser. No. 127,778**

**Claims priority, application Fed. Rep. of Germany, Mar. 9, 1979, 2909227**

**Int. Cl.³ B23B 5/18; B24B 5/00**

**U.S. Cl. 82—9** **32 Claims**



1. In a machine tool of the type including at least one headstock and one tailstock and two clamping heads each coupled with one of said stocks for holding and rotating a workpiece which has a longitudinal axis and portions to be machined which are transversely offset from said longitudinal axis and also offset angularly relative to one another, a combination comprising

at least one indexing head intermediate the headstock and the one clamping head coupled therewith, said indexing head being connected with said one clamping head for rotation about an axis of rotation of said headstock;

first means on said indexing head for displacement of the same transversely of said axis of rotation by a distance corresponding to the respective transverse offset; and

second means for selectively indexing said indexing head irrespective of whether said one clamping head is rotating or stationary.

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**4,297,927**

## SHEET METAL POSITIONING AND GRIPPING APPARATUS AND METHOD

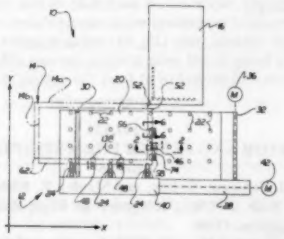
**Naoki Kuroda, Kyoto, Japan, assignor to The Warner & Swasey Company, Cleveland, Ohio**

**Filed Mar. 6, 1980, Ser. No. 127,800**

**Claims priority, application Japan, Mar. 24, 1979, 54-34721**

**Int. Cl.³ B26D 7/01**

**U.S. Cl. 83—36** **29 Claims**



9. An apparatus comprising cutter means for cutting sheet material workpieces, support means for at least partially supporting a sheet material workpiece, movable holder means for holding the sheet material workpiece during cutting of the workpiece by said cutter means, means for moving said holder means relative to said support means to change the position of

the sheet material workpiece held by said holder means relative to said cutter means, and positioning means for positioning the sheet material workpiece relative to said holder means, said positioning means including first gripper means for gripping the sheet material workpiece and moving the workpiece in a first direction relative to said support means and said holder means and second gripper means for gripping the workpiece and moving the workpiece in a second direction relative to said support means and said holder means, said second gripper means including means for moving the sheet material workpiece and said first gripper means in the second direction relative to said support means while said first gripper means is gripping the workpiece.

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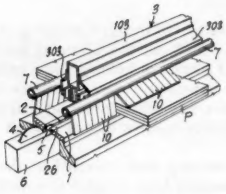
**4,297,928**

## GUARD FOR SAWING MACHINES

**Gino Benuzzi, Bologna, Italy, assignor to Giben Impianti S.p.A., Pianoro, Italy**

**Filed May 28, 1980, Ser. No. 154,158**
**Int. Cl.³ B27B** *11/10, 5/29*
**U.S. Cl. 83—57** **10 Claims**



**1**. In a sawing machine of the type comprising a horizontal workpiece support table (**1**) having a straight longitudinal slot (**2**) defining a cutting line, a sawing tool (**4**) mounted on a carriage (**6**) reciprocably movable along a path parallel to and beneath said cutting line, and a longitudinal pressure bar (**3**) arranged above said workpiece support table (**1**), said pressure bar (**3**) extending along the entire length of said cutting line and movable upwardly and downwardly with respect to said workpiece support table (**1**) so as to be capable of blocking thereon a workpiece (P) to be sawed, the improvement comprising

(a) a first safety device comprising a protective barrier apron extending along both sides of said cutting line, said protective barrier apron comprising a plurality of slats (**10**) hingedly mounted, for swinging movement through a predetermined angle of oscillation, on longitudinal apron rods (**7**) arranged at both sides of said cutting line; and

(b) a second safety device comprising a longitudinal inner contact bar (**14**) and a longitudinal outer contact bar (**13**) hangingly mounted on each side of said pressure bar (**3**) for vertical movement with respect thereto, said inner and outer contact bars (**13, 14**) being adapted to cooperate, upon being lifted with control devices (**19, 20**) acting on the control circuit of at least the cutting saw (**6**).

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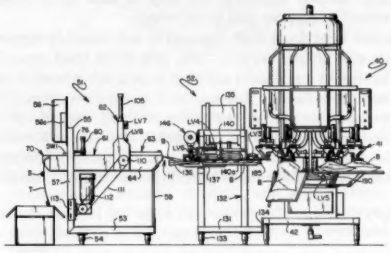
**4,297,929**

## SEPARATOR AND FEEDER FOR A STRIP OF FLEXIBLE BAGS

**Warren J. Schieser, Dublin, and Stanley E. Vickers, Hideaway Hills, both of Ohio, assignors to Liqui-Box Corporation, Worthington, Ohio**

**Filed Dec. 20, 1979, Ser. No. 105,567**
**Int. Cl.³ B26D** *7/00;* **B65B** *3/00*
**U.S. Cl. 83—110** **28 Claims**

**1**. A separator and feeder for separating a flexible strip at successive longitudinally-spaced transverse intervals comprising a vertically-reciprocable separator means extending transversely, means for intermittently reciprocating said separator means, conveyor means for intermittently and positively advancing the strip longitudinally to said separator means and for intermittently and positively moving the separated part of the strip away from said separator means, and means for timing the reciprocating of said separator means and said conveyor means; said conveyor means including a first set of rolls comprising upper and lower transversely-extending draw rolls disposed ahead of said separator means for advancing the strip to the separator means and comprising a lower gripping roll and a pair of axially-spaced upper gripping rolls to provide a passage so that upward projections on the strip can pass between said upper rolls, said conveyor means also including a discharge conveyor disposed just beyond said separator means which includes a second set of upper and lower transversely-extending rolls and a third set of upper and lower transversely-



extending rolls spaced longitudinally beyond the second set, laterally-spaced gripping bands passing continuously around the respective lower and upper rolls of the second and third sets to grip the strip therebetween, said second and third sets of rolls having axially-spaced upper rolls to provide a passage in alignment with the first-named passage, said bands on the upper rolls of the second and third sets being divided into two laterally-spaced groups carried by the upper rolls of the respective second and third sets with said passage therebetween, each laterally-spaced group being carried by a frame mounted for swinging movement around the axis of the laterally-spaced upper rolls of the second set, and means for intermittently producing said swinging movement to release the gripped severed portion of the strip in timed relationship to the intermittent movement of the conveyor means.

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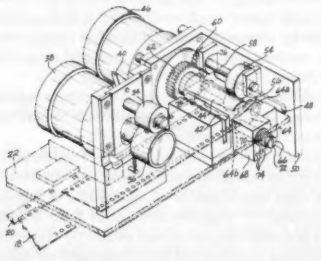
**4,297,930**

## STRIP CUTTER HAVING ROTATABLE CUTTING BLADE AND STRIP DEFLECTING MEANS

**Dwayne H. Putzke, Issaquah, Wash., assignor to CX Corporation, Seattle, Wash.**

**Filed Sep. 4, 1979, Ser. No. 72,426**
**Int. Cl.³ B26D** *5/20*
**U.S. Cl. 83—156** **4 Claims**



**1**. A photographic processing apparatus for severing an

advancing strip into successive segmental lengths and for mechanically segregating these segmental lengths in conjunction therewith, said apparatus comprising:

strip feed means for advancing said strip in a lengthwise direction;

strip guide means for guiding the advancing strip past the cutting station in a predetermined path of advancement continuing past said cutting station;

cutter blade means mounted at said cutting station and operable to sever from the strip segmental lengths thereof that have advanced past said cutting station, said blade means having a home position wherein it permits passage of the strip along said path of advancement before severance and being movable through a cutting stroke from said home position and back into said home position, said blade means further having a strip deflecting position wherein it permits passage of the advancing strip beyond said cutting station while deflecting the strip from said path of advancement before severance;

blade actuating means operable to move the blade means into and from said home and deflecting positions and through said cutting strokes in timed relation with strip advancement positionings effected by said strip feed means; and

ejector means for assisting the advancement of said segmental lengths away from said cutting station after severance, said ejector means including a first roller mounted above the path of advancement of said strip beyond said cutting station, said first roller being drivingly coupled to said blade means such that said first roller rotates in response to movement of said blade means, said first roller being clutched so that it rotates only in response to movement of said blade means from said cutting stroke toward said home position, a pressure roller rotatably mounted below the path of advancement of said strip beyond said cutting station, said first roller and said pressure roller cooperating to form a nip, said severed strip segment engaging said nip after passing said cutting station and biasing means associated with said pressure roller for biasing said pressure roller toward said first roller.

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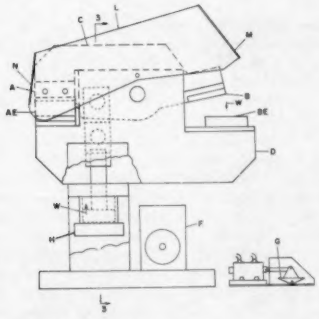
**4,297,931**

## DOUBLE ENDED METAL CLEANING SHEAR

**Kenneth R. Lessard, Albany, Ga., assignor to Econ Scrap Shear Co., Albany, Ga.**

**Filed Jan. 23, 1980, Ser. No. 114,336**
**Int. Cl.³ B23Q *11/00*; B26D *5/12***
**U.S. Cl. 83—397** **3 Claims**



**1**. In a double ended metal cleaning shear, a horizontally disposed bed, a rocking beam pivotally and rockably mounted on said bed, recessed blades on each end of said bed, shearing blades on both ends of said rocking beam matching and coacting with the recessed blades of the bed, a hydraulic power unit operatively connected to said beam for selectively causing shearing action between the blades on the beam and the blades on the bed, foot control pedal means for controling said hydraulic power unit, and a single safety guard rockably mounted on said pivoted beam, and wherein the safety guard can be rocked to completely guard blades on one end while providing a working space guard on blades on the opposite end, and wherein the safety guard can be rocked to another position to completely guard the other end blades while leaving a working space guard on the first named blades, and wherein the hydraulic power unit includes a cylinder for operating the cutting stroke of the blades on one end when the cylinder moves in one direction and operates the cutting stroke of the blades on the opposite end when the cylinder moves on the returning stroke.

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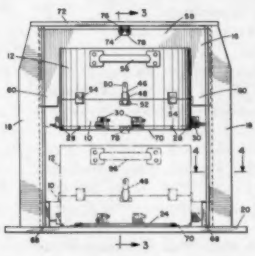
**4,297,932**

## CHEESECAKE CUTTING MACHINE

**John J. Wells, Jr., 8818 Via Andar, San Diego, Calif. 92122, and Donald R. Kleine, El Cajon, Calif., assignors to John J. Wells, Jr., National City, Calif.**

**Filed Mar. 24, 1980, Ser. No. 133,115**
**Int. Cl.³ B26D *3/24***
**U.S. Cl. 83—581.1** **6 Claims**



**1**. A slicing apparatus comprising:

an open ended cutting cylinder;

a plurality of wires, each being longer than the diameter of the cutting cylinder;

a plurality of wire retaining means mounted on the cutting cylinder for securing the one ends of the wires at respective annularly spaced locations about the cutting cylinder;

a plurality of adjustable tensioning means mounted on the cutting cylinder for holding the other ends of the wires tightly across the cutting cylinder, the tensioning means being annularly spaced about the cutting cylinder so that each wire extends substantially diametrically across the cutting cylinder, through its central axis; and

means for supporting the cutting cylinder for vertical reciprocation along the central axis of the cutting cylinder, including:

a generally horizontal planar base,

a pair of spaced apart vertically extending tracks mounted on the base,

an open ended guide cylinder having substantially the same diameter as the cutting cylinder,

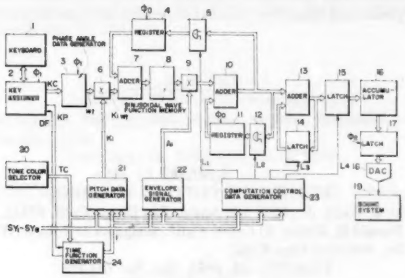
a yoke mounted to the guide cylinder and having side edges slidably engaged with respective ones of the tracks so that the guide cylinder can be vertically reciprocated about its central axis, and

releasable latch means for attaching the cutting cylinder beneath the guide cylinder with the central axes of the cylinders in substantial alignment.

## 4,297,933
## ELECTRONIC MUSICAL INSTRUMENT FOR TONE FORMATION BY SELECTABLE TONE SYNTHESIS COMPUTATIONS

**Tetsuo Nishimoto, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan**

**Filed Nov. 14, 1979, Ser. No. 94,084**
**Claims priority, application Japan, Nov. 16, 1978, 53-141466**
**Int. Cl.³ G10H** *1/06, 5/00*
**U.S. Cl. 84—1.01** **6 Claims**



**1.** An electronic musical instrument comprising:

a tone property seleting device for selecting a property of tones to be produced;

keyboard keys for designating note names of tones to be produced;

a computation control data generation circuit for storing different sets of computation control data corresponding to respective properties of tones to be produced and delivering out a selected set of the control data corresponding to the selected property of each tone to be produced; and

a tone signal forming circuit including computation performing circuitry for implementing a set of arithmetic or trigonometric computations determined from among a plurality of available implementable computations in accordance with the computation control data delivered by said computation control data generation circuit and thereby forming a tone signal of a note designated by said key and of a property selected by said selecting device, each set of control data causing said tone signal forming circuit to implement a set of different mathematical computations, whereby as a result of said different computations, a tone of different property is generated.

## 4,297,934
## DISPLAY DEVICE FOR AUTOMATIC RHYTHM PERFORMANCE APPARATUS

**Akio Imamura, and Akiyoshi Oya, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan**

**Filed Apr. 22, 1980, Ser. No. 142,757**
**Claims priority, application Japan, Apr. 24, 1979, 54/55656[U]**
**Int. Cl.³ G10F** *1/00*
**U.S. Cl. 84—1.03** **6 Claims**

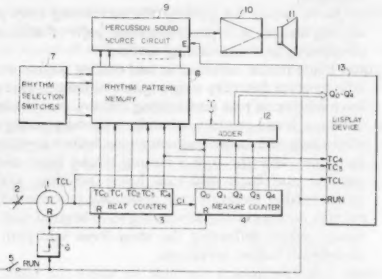
**1.** A display device for an automatic rhythm performance apparatus of the type having a tempo generator which generates a sequence of tempo pulses, and having a switch that is actuated to initiate the running of a rhythm performance, comprising:

means for forming a first digital display signal representing a tempo corresponding to said tempo pulses generated by said tempo generator;

means for forming a second digital display signal representing a rhythm advancement in accordance with outputs of a counter which is driven by said tempo pulses;

a digital display unit; and

display signal selecting means for selectively carrying out a switching operation so that, under the condition that

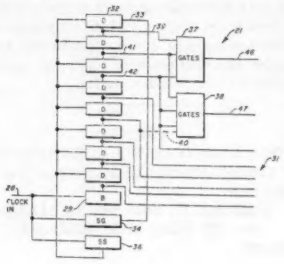


rhythm performance is stopped, said first digital display signal is applied to said display unit and, under the condition that said rhythm performance is running, said second digital display signal is applied to said display unit.

## 4,297,935
## DIVIDER KEYER CIRCUIT FOR SYNTHESIS ORGAN

**Ray B. Schrecongost, Park Ridge, Ill., assignor to Marmon Company, Chicago, Ill.**

**Filed Feb. 24, 1978, Ser. No. 880,829**
**Int. Cl.² G10H** *5/02*
**U.S. Cl. 84—1.01** **7 Claims**



**1.** A divider keyer circuit arrangement for a 61 note electronic synthesis organ keyboard having a plurality of harmonic controls which includes four identical forty pin integrated circuit packages, each of which comprises:

a first note-related keyer section having six keyer groups each of which is coupled to a different keying wave form input line and each of which has a plurality of keyers coupled to a different harmonic control line;

a first primary divider section coupled to a first clock line to a top octave clock generator output for said first note and including a series of dividers operable to divide said generator output successively by two to produce a series of tone signal divider outputs and further including means for generating a synchronization signal on said first clock line and further including synchronization signal detection means coupled to said first clock line for detecting said synchronization signal and resetting said dividers in response thereto;

a first third-harmonic divider section coupled to a first third-harmonic clock line to a top octave clock generator output for a note third harmonically related to said first note, said third-harmonic top octave clock generator output being utilized as a primary divider section top octave source for a note on a different one of said four identical

integrated circuit packages, and including a series of dividers operable to divide said output successively by two to produce a series of tone signal divider outputs and further including synchronization signal detection means coupled to said first third-harmonic clock line for detecting a synchronization signal placed on said clock line by the synchronization signal generating means of the primary divider section which receives said third-harmonic top octave clock generator output as a source and is located on said different one of said four identical integrated circuit packages and for resetting said third-harmonic dividers in response thereto; and

a second note-related keyer section having five keyer groups, a third note-related keyer section having five keyer groups, a second primary divider section, a third primary divider section, a second third-harmonic divider section, and a third third-harmonic divider section;

said first note-related keyer section being coupled to said tone signal divider outputs from said first primary divider section, to said tone signal divider outputs from said first third-harmonic divider section, and to one tone signal divider output from said second primary divider section to borrow a signal equal to the fifth harmonic of said first note from said second primary divider section;

said second note-related keyer section being coupled to tone signal divider outputs from said second primary divider section, to tone signal divider outputs from said second third-harmonic divider section, and to one tone signal divider output from said third primary divider section to borrow a signal equal to the fifth harmonic of said second note from said third primary divider section; and

said third note-related keyer section being coupled to tone signal divider outputs from said third primary divider section, to tone signal divider outputs from said third third-harmonic divider section, and to one tone signal divider output from said first primary divider section to borrow a signal equal to the fifth harmonic of said third note from said first primary divider section.

7. In a divider keyer integrated circuit package for a synthesis electronic organ having a top octave signal source, a progressive duty cycle tone signal generation circuit comprising:

divider means coupled to said top octave signal source for producing a series of 50% duty cycle square wave outputs;

first gating means for combining a plurality of said square wave outputs and providing as a first gating means output a rectangular wave having a 37.5% duty cycle for enhancing the second and fourth harmonics and reducing the level of third harmonics;

second gating means for combining a pluraiity of said square wave outputs and providing as a second gating means output a rectangular wave having a duty cycle between 50% and 37.5% for providing a smooth transition between said harmonically enriched 37.5% duty cycle rectangular wave and said 50% duty cycle square wave; and

keyer means coupled to said divider means outputs, said first gating means output and said second gating means output for keying said square waves and rectangular waves.

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**4,297,936**

## RETRACTABLE FRET SYSTEM FOR STRINGED INSTRUMENTS

**Martin J. Mouton, 619 Roseland Pkwy., Harahan, La. 70123**

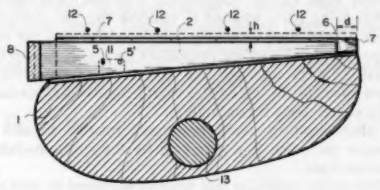
**Filed Apr. 9, 1980, Ser. No. 138,715**
**Int. Cl.³ G10D *3/06***
**U.S. Cl. 84—314 R** **6 Claims**

1. A stringed, musical instrument having frets, comprising:

an elongated neck having an upper surface;

a series of vibratable musical strings stretched along the length of said neck and supported above and spaced from said upper surface;

a series of laterally disposed, longitudinally spaced frets mounted on said neck and vertically moveable into and out of protruding disposition above said upper surface and in juxtaposition to said strings; and



manual actuating means for moving said frets into and out of said protruding disposition during play of the instrument when so desired by the player.

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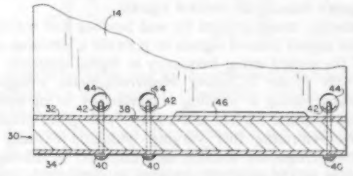
**4,297,937**

## ARM AND KEY BED ASSEMBLY FOR A PIANO AND THE LIKE

**Robert J. Mayerjak, Torrington, Conn., assignor to Currier Piano Company, Inc., Marion, N.C.**

**Filed Sep. 21, 1979, Ser. No. 77,851**
**Int. Cl.³ G10C *3/04***
**U.S. Cl. 84—430** **8 Claims**



1. An arm and key bed assembly in a piano or like instrument having a keyboard comprising:

a laminated key bed having an upper bed surface on which the keyboard of the instrument is mounted and a parallel lower surface, the laminates being securely bonded together to form a rigid bed, the outer laminates defining the upper and lower surfaces of the bed being sheet metal laminates;

an arm joined with one end of the key bed and defining a shelf against which one of said surfaces of the bed defined by the sheet metal laminates rests at the one end of the bed,

a nut mounted within the arm at a position spaced from the shelf, the axis of the hole through the nut intersecting the shelf in generally perpendicular relationship; and

a threaded fastening member extending through the laminated key bed and the arm generally perpendicular to the shelf and in threaded engagement with the nut for drawing said one surface of the bed defined by the sheet metal laminates and the shelf into clamping engagement at high force levels.

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**4,297,938**

## ELECTRONIC TUNING AID WITH DIGITAL READOUT

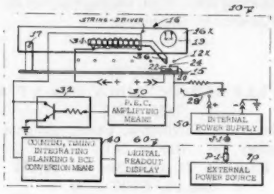
**Archie D. Kirby, 4170 N. Marine Dr., Chicago, Ill. 60613**

**Filed Sep. 12, 1979, Ser. No. 74,674**
**Int. Cl.³ G10G *7/02***
**U.S. Cl. 84—455** **11 Claims**

1. Compact portable apparatus for use in sensing and displaying in digital terms the frequency of musical instrument strings vibrating in either damped or undamped mode, and comprising in accordance with the invention:

(a) a housing for placement on the instrument in adjacency to a complement of strings thereon;

(b) a vibration sensing probe constituting a movable part of said housing and having a sensing head positionable relative to any selected string of the complement;
(c) said head having respectively overlying and opposite underlying parts adapted to straddle the selected string, one of said parts including a light source and the other opposite part including optical slit means positioned such that the selected string will vibrate crosswise of the slit and substantially along the length thereof and modulate the source light accordingly;
(d) photosensitive means positioned relative to said slit means such that it is activated by the string-modulated source light;
(e) first circuit means in said housing activated by said photosensitive means to produce frequency analogue signals from said string-modulated source light;



(f) further circuit means in said housing converting said signals into digital control signals;
(g) display means carried by said housing and activated by said digital control signals to provide a luminous readout of the sensed string frequency in digital notation;
(h) said probe including electromagnetic string-driving means having a winding traversed by string-modulated photoelectric current and a salient pole piece producing a string-vibrating flux varying with the existing sensed string frequency located and disposed in driving adjacency to the selected string as an incident to operative placement of the sensing head relative to such string, whereby magnetically responsive strings will be driven in sustained vibration at whatever sensed frequency the string happens to be tuned.

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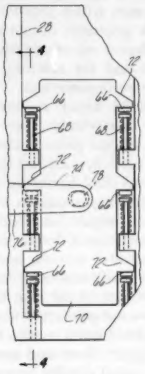
**4,297,939**

## AMMUNITION FEEDER

**Tomas R. Castillo, Fountain Valley, and Arthur L. Gardiner, Tustin, both of Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Jun. 8, 1979, Ser. No. 47,596**
**Int. Cl.³ F41D** *10/08*
**U.S. Cl. 89—33 L** **1 Claim**

1. In combination, a recoil-operated gas assisted gun having a linked ammunition feeder means (**20**) arranged thereon for movement normal to the gun axis; an ammunition-link guide housing (**28**) swingably mounted on the gun for movement from a downloader position to an upfeed position; three sets of deflectable spring-urged pawls (**64**) carried within the link guide housing in vertically-spaced relationship to each other for supportably engaging undersurface areas of adjacent ammunition links, thereby accurately positioning the supported ammunition rounds; said spring-urged pawls including an upper set of pawls, an intermediate set of pawls, and a lower set of pawls; the pawls being dimensioned so that the upper set of pawls supports a significant portion of the weight of the uppermost ammunition round, the intermediate sets of pawls supports a significant portion of the weight of the intermediate ammunition round, and the lower set of pawls supports the weight of the remaining rounds in the linked ammunition system; each pawl having a stop surface thereon normally abutting against an internal shoulder (**69**) on the link guide housing, whereby at least a portion of the weight of the associated ammunition round is transmitted to the guide housing; each pawl having an actuator arm (**66**) extending beyond an outboard face of the link guide housing; a manually-actuatable plate (**70**) slidably arranged on the outboard face of the link guide housing for vertical movement in a plane parallel to a plane passing through the pivot axes of the swingable pawls;



said plate having thrust surfaces (at **72**) engageable with the pawl actuator arms, whereby plate movement in the downward direction causes the pawls to be pivoted outwardly to positions disengaged from the ammunition links, so that the linked ammunition can be downloaded out of the link guide housing.

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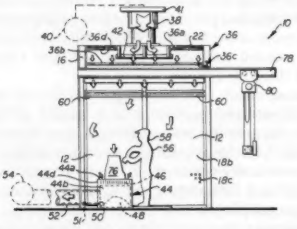
**4,297,940**

## PROTECTIVE WORKPLACE AND SYSTEM

**Truman D. Hainline, Peoria, Ill., assignor to Tellus Machinery Corporation, Peoria, Ill.**

**Filed Jan. 31, 1980, Ser. No. 117,242**
**Int. Cl.³ F24F** *7/00*
**U.S. Cl. 98—33 R** **9 Claims**



1. A protective modular workplace apparatus comprising:
(a) a plurality of connected walls at least partially enclosing a workplace, said walls forming a doorway therewith, each of said walls including a first reinforcing member connected to a pair of spaced panels, at least one of said panels being a sound-absorbing panel, a sound-absorbing material retained by said first reinforcing members and said panels, and a second reinforcing member attached to an edge surface of each wall, said second reinforcing member of one wall connected to a second reinforcing member of an adjacent wall;
(b) said first reinforcing member includes a rib and a pair of spaced flanges, said first member rib being recessed between said panels, said first member flanges and panels having coextensive portions terminating in side-by-side

relationship, said coextensive portions being affixed, and second reinforcing member includes a rib and a pair of spaced flanges, said second member rib forming an edge of said wall, said coextensive portions of said first member flanges and panels being recessed within said second member abutting said second member rib, said first and second reinforcing members being in reciprocal relationship;

(c) a roof connected to said walls, said roof including an upper panel spaced from a lower panel, said upper panel having means, such as a first flower, for urging ventilating air between said panels, said first blower having a deflector associated therewith, said lower panel having openings formed therein, said openings being of a construction sufficient for permitting said air to pass therethrough and into said workplace; and

(d) means, in a portion of said walls, for urging said ventilating air from said workplace, said means including a second blower substantially matched to said first blower.

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**4,297,941**

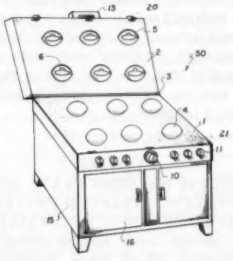
**MULTIPLE SAUCER SANDWICH COOKING DEVICE**

**Denise Gallina, 68 E. Prospect St., Waldwick, N.J. 07463**

**Filed May 4, 1979, Ser. No. 35,916**

**Int. Cl.³ A47J *37/00***

**U.S. Cl. 99—332** **1 Claim**



**1.** A multiple saucer sandwich cooking oven comprising, a base plate having a first plurality of sandwich sized mold indentations therein, a top plate pivotally mounted to said base plate having a second plurality of sandwich sized mold indentations therein corresponding to said first plurality of indentations in number and positioning, heating means connected to said top and base plates, said first and second plurality of indentations define a plurality of sandwich molds therebetween when said top plate is pivoted into its closed position with said base plate, whereby said heating means is activated for cooking a sandwich assembly positioned within each of said sandwich molds, a resistance heating element in each of said mold indentations in said top plate having a selected configuration for branding the surface of a sandwich assembly prepared in each of said sandwich molds, said heating means comprising resistance electric heating elements, said mold indentations being in a saucer shape and said resistive heating element being in the shape of a disc, and said heating element further comprising a timer for setting the heating element at a predetermined time thereby cooking the sandwich assembly to a desired degree, and wherein said sandwich molds are coated with Teflon so that the sandwich assembly does not stick to the molds.

**4,297,942**

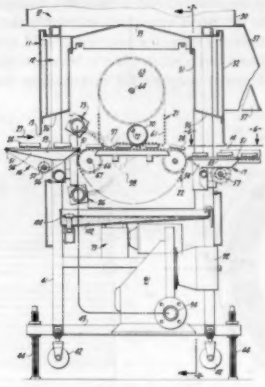
**METHOD AND APPARATUS FOR FLAVORING AND SURFACE TREATMENT OF MEAT PRODUCTS**

**Clark K. Benson, Millbrae; Andrew A. Caridis, Foster City, and Arthur A. Nilsen, San Francisco, all of Calif., assignors to Heat and Control, Inc., San Francisco, Calif.**

**Continuation of Ser. No. 489,131, Jul. 17, 1974, abandoned. This application Jan. 28, 1976, Ser. No. 653,192**

**Int. Cl.³ A47J *37/00***

**U.S. Cl. 99—386** **5 Claims**



**1.** Apparatus for imparting surface treatment such as searing and branding to a food product comprising a frame, a housing on said frame and having an inlet and an outlet serving to permit the receiving and discharging of the product with respect to said housing; horizontally spaced apart, inlet and outlet conveyor means extending respectively into said housing inlet and outlet, branding means movably arranged in said housing between said spaced apart inlet and outlet conveyor means to receive the product discharged from said inlet conveyor means and serving to convey the product horizontally within the housing for treatment and to discharge the product upon said outlet conveyor means, said branding means remaining at all times within said housing and including a first branding mechanism serving to mark the top side portion of the product, and a second branding mechanism serving to mark the bottom or underside portion of the product and to support the product and move the same from said inlet to said outlet conveyor means, each said branding mechanisms comprising an endless belt structure formed of spaced apart parallel, interlinked rod-like branding elements, first and second drive means serving to drive in synchronism said first and second branding mechanisms respectively, the drive means for said first branding mechanism serving to support the top run of the endless belt structure for the first branding mechanism and permitting the bottom run of said belt structure to drape downwardly for engagement with the top surface of the product flame heating means in said housing to cause flame to impinge upon such food product and upon said rod-like branding elements as the food product is moved by the branding means from said inlet to said outlet conveyor means, and power means serving to drive said inlet and outlet conveyor means and said first and second drive means for the branding means.

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**4,297,943**

**CAGE ASSEMBLY FOR PRESS ASSEMBLY**

**Victor R. Laurich-Trost, 34600 McAfee Dr., Solon, Ohio 44139**

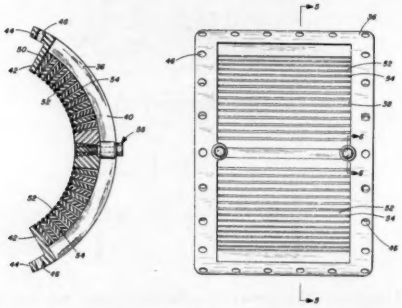
**Filed Dec. 10, 1979, Ser. No. 101,899**

**Int. Cl.³ B30B *9/06***

**U.S. Cl. 100—129** **5 Claims**

**1.** In a screw press apparatus of the type for expressing liquid from a processed material including at least one drainage sec-

tion for receiving the material to be processed therethrough including, in combination, a removable window-like cage assembly to provide a liquid drainage system which is accessible for removal completely from the exterior of the apparatus, said window-like cage assembly including at least pair of generally semi-cylindrical panel members each having a polygonal window-like opening, each panel including a plurality of parallel elongated screen bar elements circumferentially mounted within the opening of said panel so as to extend radially in respect to the longitudinal central axis of the press, selectively adjustable means adapted for detachably connecting each of said panels to the press apparatus to enable the panels to be removed completely from the exterior of said apparatus, resilient spring means disposed as spacers between adjacent of said screen bar elements adapted for maintaining said screen bar



elements in resilient circumferentially spaced relationship within each of said panels, selectively adjustable wedged block means adapted for camming co-acting engagement for holding said screen bar elements in circumferentially spaced relationship with said window-like openings, said wedge-block means being disposed centrally of said screen bar elements and including a radially adjustable wedge-block member and a pair of elongated cam-like wedge block members disposed on either side of said adjustable wedge block member adapted for selective radial movement toward and away from the longitudinal central axis of said press apparatus for circumferentially moving associated of said screen bar elements resiliently toward and away from one another for selectively maintaining a predetermined circumferential pressure on said screen bar elements thereby to give a predetermined drainage area through the spaces between adjacent of said screen bar elements.

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**4,297,944**

## PRINT HAMMER DRIVING MEANS FOR IMPACT PRINTERS

**Shohachi Nihira, Tanashi, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan**

**Filed Aug. 15, 1979, Ser. No. 66,775**

**Claims priority, application Japan, Aug. 28, 1978, 53-104516**

**Int. Cl.³ B41J 9/36**

**U.S. Cl. 101—93.31** **9 Claims**

1. A printer hammer driving means for impact printers, comprising:

a rotatably mounted type drum having a plurality of columns,

a plurality of type characters arranged circumferentially spaced from each other for each column,

a plurality of print hammers movable towards said type drum for printing,

each of said print hammers having a print head corresponding to each column,

a hammer spring provided to bias each print hammer towards said type drum,

a positioning spring adapted to bias said print hammer towards a waiting position,

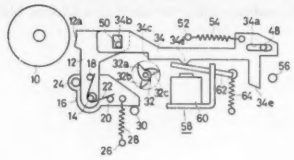
a lever movable along a path for deflecting said hammer spring,

a snatch roll having at least one tooth engageable with said lever for deflecting said hammer spring so as to produce an elastic force greater than the force of said positioning spring,

electromagnetic means operative to hold said lever out of engagement with said snatch roll during de-energization and to bring said lever into engagement with said snatch roll upon energization,

means for rotating said snatch roll and said type drum in a predetermined rotational ratio, and

means for actuating said electromagnetic means at a predetermined timing,



said lever and snatch roll being disposed such that said engagement therebetween disengages after a predetermined angular rotation of said snatch roll, and

an elongated slot provided in said lever for permitting said lever to be reciprocated away from said type drum by said snatch roll, and a stop member being positioned to limit the reciprocal motion of said lever and to convert it to rotational motion, whereby said lever is moved by engagement with said snatch roll for a predetermined period to defect said hammer spring and after said predetermined period continued rotational movement disengages said lever from said snatch roll permitting movement of said lever and said print hammer towards said type drum by said deflected hammer spring.

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**4,297,945**

## RESIN ORIGINAL PATTERN PLATE AND METHOD FOR TRANSFERRING RELIEVED PATTERN THEREOF TO THERMOPLASTIC RESIN MATERIAL

**Takezo Sano; Tadanori Inoue, both of Ibaragi, and Yukikazu Uemura, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Ltd., Japan**

**Division of Ser. No. 682,724, May 3, 1976, Pat. No. 4,156,384, which is a continuation-in-part of Ser. No. 427,655, Dec. 26, 1973, abandoned. This application Mar. 9, 1979, Ser. No. 19,143**

**Claims priority, application Japan, Dec. 28, 1972, 67-1393; Dec. 28, 1972, 67-1394**

**The portion of the term of this patent subsequent to May 29, 1996, has been disclaimed.**

**Int. Cl.³ B41N 1/12**

**U.S. Cl. 101—395** **3 Claims**

1. A resin original pattern plate for use in transferring a relieved pattern, said pattern plate (a) having an elastic modulus of at least 10 kg/cm$^2$ at 200° C., (b) a thickness of from about 0.1 mm to about 5 mm, and (c) being prepared by controlling the cross-linkability of a photo-polymerizable resin composition and then photo-polymerizing, wherein said photo-polymerizable resin composition is (1) a photo-polymerizable resin composition comprising, as its major ingredients, a polymer free of cross-linkable double bonds, a polyfunctional monomer, a photosensitizer, and a thermal polymerization inhibitor, said poly-functional monomer constituting about 10 to about 90% by weight of the total weight of said composition and said polymer free of cross-linkable double bonds having a viscosity of at least $10^3$ poise at 200° C. or (2) a photo-polymer-

izable resin composition comprising, as its major ingredients, a cross-linkable polymer, a monomer, a photosensitizer, and a thermal polymerization inhibitor, said cross-linkable polymer having a molecular weight of at least 1,000 and containing double bonds in an amount of at least one for each 1,000 molecular weight, and said monomer constituting 5 to 50% by weight of the total weight of the composition.

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**4,297,946**

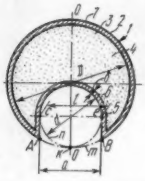
## EXTENDED SHAPED CHARGE AND METHOD OF MAKING SAME

**Boris E. Paton, ulitsa Chkalova, 41-a, kv. 26; Vladimir M. Kudinov, ulitsa Filatova, 1/22, kv. 51; Leonid A. Volgin, ulitsa Erevanskaya, 14 g, kv. 33; Vladimir G. Petushkov, ulitsa Pugacheva, 19a, kv. 6; Jury P. Bushtedt, bulvar Likhacheva, 3, kv. 7; Anatoly Y. Koroteev, Sapernoe pole, 9/21, kv. 27, and Viktor A. Kotov, Goloseevo, 3, kv. 7, all of Kiev, U.S.S.R.**

**Filed Dec. 5, 1978, Ser. No. 966,642**

**Int. Cl.³ C06C *7/02*; F42B *3/08*; C06B *21/00***

**U.S. Cl. 102—307** **11 Claims**



**1.** An extended shaped charge comprising a high explosive material and a one piece, integral tubular body, a profile of the tubular body having a convex portion shaped to the form of a first curvilinear length and a concaved portion shaped to the form of a second curvilinear length, said tubular body having an integral wall defining a cavity filled with said high explosive material and a charge hollow disposed on an exterior side of the concaved portion of the profile, the wall of said tubular body being thinner on the side of the charge hollow, the first and the second curvilinear lengths being respectively portions of first and second closed curves having a common symmetry axis and being internally tangent to each other at a point lying on said symmetry axis, the only contact between the closed curves being at the point of tangency, the first curvilinear length being conjugate with the second curvilinear length so that the width of the charge hollow measured by a chord of the first closed curve between the points of intersection thereof with tangents to the extreme points of the second curvilinear length being not less than a length of a great chord of the second closed curve normal to the symmetry axis of the profile.

**9.** A method of making an extended shaped charge having a high explosive material contained within a tubular body, the tubular body having a profile with a convex portion shaped to the form of a first curvilinear length and a concaved portion shaped to the form of a second curvilinear length, said tubular body having a wall defining a cavity filled with said high explosive material and a charge hollow disposed on an exterior side of the concaved portion of the profile, the first and the second curvilinear lengths being respectively portions of first and second closed curves having a common symmetry axis and being internally tangent to each other at a point lying on the symmetry axis, the first curvilinear length being conjugate with the second curvilinear length so that the width of the charge hollow measured by a chord of the first closed curve between the points of intersection thereof with tangents to the extreme points of the second conjugate length is not less than a length of a great chord of the second closed curve normal to the symmetry axis of the profile, said method comprising:

filling a tubular member with a high explosive material, the tubular member having a convex portion shaped to the form of a first curvilinear length; and

shaping the tubular member with an element having a convex configuration of a second curvilinear length to thereby deform the tubular member and form a shaped charge having high explosive material contained within a tubular body having a profile with a convex portion shaped to the form of the first curvilinear length and a concaved portion shaped by said element to have the form of the second curvilinear length, the concaved portion being shaped so that the closed curves contact each other only at the point of tangency.

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**4,297,947**

## ELECTRIC IGNITER

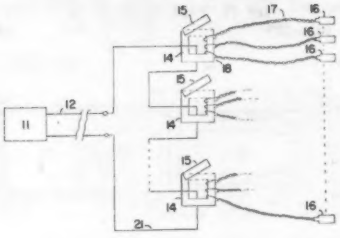
**Eirwyn Jones, Alloway, Scotland, and Michael I. Mitchell, Runcorn, England, assignors to Imperial Chemical Industries Limited, Millbank, England**

**Filed May 15, 1979, Ser. No. 39,443**

**Claims priority, application United Kingdom, May 24, 1978, 21735/78**

**Int. Cl.³ F42C *11/00***

**U.S. Cl. 361—248** **45 Claims**



**1.** An electrically actuatable ignition assembly comprising:

a resistive electric ignition element within a casing and having two electrical connection terminals within the casing; and

a continuous length of insulated electrically conductive wire having its two ends electrically connected to said two terminals of the electric ignition element to form a continuous electrical circuit therebetween and extending outside of the casing without any exposed uninsulated wire joint outside of the casing, a portion of the continuous length of wire providing a loop adapted for electromagnetic coupling to a transformer core.

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**4,297,948**

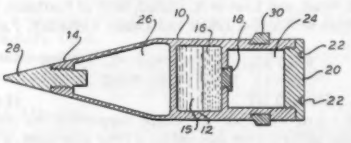
## PROJECTILE

**William F. Donovan, Harford City, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Division of Ser. No. 948,127, Oct. 3, 1978, Pat. No. 4,241,660. This application Mar. 4, 1980, Ser. No. 122,793**

**Int. Cl.³ F42B *11/22, 13/00***

**U.S. Cl. 102—473** **3 Claims**



**1.** A projectile having variable stability, said projectile being arranged to be spin stabilized and comprising:

a casing having a sealed cavity, said cavity shaped to pro-

vide a balanced flow about the longitudinal axis of said projectile;

a first liquid of a given mass contained within said cavity; and

a second liquid of a different density than said first liquid operatively contained within said cavity to eliminate any ullage of said cavity, said second liquid being immiscible in said first liquid, wherein said second liquid is vortically impelled by said projectile spin, wherein said cavity is shaped to provide a balanced flow of said second liquid with respect to the axis of spin as said projectile is trajected, said balanced flow altering the flight stability of said projectile, wherein said first and second liquids completely fill said cavity, and wherein the elimination of said ullage from said cavity provides controlled gyroscopic stability to said projectile.

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**4,297,949**

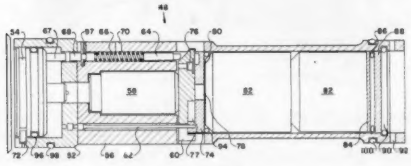
## CLOUD DETONATOR IN SURFACE-LAUNCHED FUEL-AIR EXPLOSIVE MINEFIELD CLEARANCE ROUND

**Cecil A. Glass, China Lake, Calif., and Dallas D. Burns, Brooklyn, Minn., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Jul. 31, 1979, Ser. No. 62,395**

**Int. Cl.**[3] **F42B** *25/12, 15/12*

**U.S. Cl. 102—229** **20 Claims**



**1**. A fuel-air cloud explosive round detonation system that launches a detonator for the explosive round comprising;

a mounting for supporting said detonation system;

a launch tube with two segments of different interior diameter inserted in said mounting for aiming said detonator along a predetermined trajectory;

a cloud detonator assembly with an obturator base within said launch tube, said detonator assembly's obturator having an outside diameter which fits within the larger inside diameter of said launch tube but is larger than the smaller interior diameter of said launch tube for placing a time delayed detonation charge in a preset location of said fuel-air cloud; and

an explosive propelling charge placed in said mounting beneath the base of said cloud detonator assembly for launching said cloud detonator assembly;

whereby said obturator remains in said launch tube when it reaches said smaller interior diameter such that explosive gases from said explosive propelling charge are sealed from the outside atmosphere.

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**4,297,950**

## TOW TRUCK

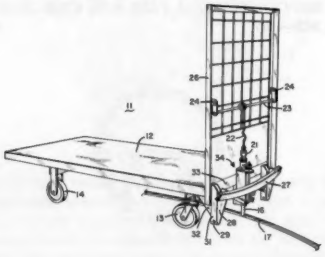
**Larry J. Funk, and Eugene A. Bluhm, both of Faribault, Minn., assignors to Nutting Truck and Caster Company, Faribault, Minn.**

**Filed Mar. 26, 1980, Ser. No. 134,128**

**Int. Cl.**[3] **B65G** *17/42;* **B61B** *13/00*

**U.S. Cl. 104—172 BT** **12 Claims**

**10**. In a tow truck having wheels supporting the truck for movement along a path defined by a floor conveyor, a generally vertical tow pin at the front of the truck movable between a lower driving position for driving engagement by such conveyor and an upper retracted position out of driving engagement with such conveyor, and an accumulation bumper at the front of the truck movable between a forwardly projecting normal running position ahead of the tow pin and truck and a rearwardly retracted accumulating position in response to engagement of the bumper with an object ahead of the truck, an improved connecting mechanism between the bumper and tow pin comprising two bell crank members pivoted for rotation on a transverse axis behind the tow pin, with one bell crank member at each side of the tow pin and each bell crank member having a first lever arm projecting upwardly from such pivot and a second lever arm projecting forwardly from such pivot along its side of the tow pin, first and second longitudinally extending connecting links each having a rear end pivotally connected to the upper end of the corresponding first lever arm and a forward end pivotally connected to the bumper and rocking the first lever arms rearwardly in response to movement of the bumper to retracted position, said longitudinally extending connecting links pivotally connecting the first



lever arms to the bumper at symmetrically spaced locations transversely from the tow pin, a cross member transversely connecting the forward ends of the second lever arms to each other, a vertically extending lifting rod extending vertically along the tow pin and having a lower end pivotally connected to the cross member between the forward ends of the second lever arms and an upper end connected to the tow pin and lifting the tow pin in response to rearward rocking of the first lever arms by the bumper and connecting links, said tow truck also having a tow pin housing which includes two parallel vertically extending side plates, one of which is located at each side of the tow pin tube, each side plate having a vertical rear edge engaging a front edge of the truck, and each side plate rear edge having a rearwardly extending lower portion projecting beneath the truck, a cross brace portion connecting said lower portions to each other, and a reinforcing bracket between said cross brace portion and truck.

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**4,297,951**

## DETACHABLE GRIP FOR COUPLING A CARRIAGE

**Roger Laurent, Chambery, France, assignor to Pomagalski S.A., Fontaine, France**

**Filed Apr. 27, 1979, Ser. No. 34,027**

**Claims priority, application France, May 2, 1978, 78 13033**

**Int. Cl.**[3] **B61B** *7/20*

**U.S. Cl. 104—209** **4 Claims**

**1**. A detachable grip for coupling a device supporting a load on to the overhead cable of a mono-cable transport installation comprising:

a grip body positioned, when the grip is coupled on to the cable, on one side of the cable;

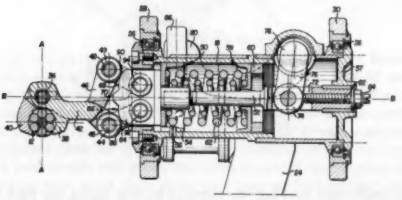
a pair of jaws carried by the body of the grip and able in their approached position to clamp the cable to fix the body of the grip to the cable, the outer profile of the said pair of jaws being so designed as to be flush with the lower surface of the clamped cable and to form a limited projection on the top of the clamped cable to allow the passing of the jaws over the cable support sheaves and under the cable hold-down sheaves;

said jaws gripping the cable when closed and disengaged from the cable when open, said open jaws allowing the cable to move down and away from the jaws without any lateral movement of said jaws;

a control mechanism carried by the said grip body having a cam means to operate the closing of each jaw and link-rod means to operate the opening of the jaws;

a spindle fixed to the body of the grip and so devised that in the position in which the grip is coupled on to the cable the said spindle extends parallel to and above the cable in the vertical plane of the cable, the said jaws being both mounted symmetrically in rotation on said spindle;

an operating shank extending from each jaw towards said link-rod, with a curved end working in conjunction with the said control mechanism to impart to the said jaws a symmetrical rotation opening and/or closing the grip, the said operating shanks projecting laterally from the jaws on the grip body side while respecting the gauge for passing over cable support sheaves and hold-down sheaves, said



operating shanks being set off in the longitudinal direction of said cable and when said jaws are closed said operating shanks as seen along the longitudinal direction of the cable, are superposed by said cable;

a piston comprising part of said control mechanism so mounted as to slide in the said grip body along an axis perpendicular to the jaw spindle, the curved ends of the operating shanks being arranged symmetrically with the said longitudinal axis and working in conjunction with the said piston;

said cam means being rigidly secured to said piston and working symmetrically in conjunction with the curved ends of the operating shanks in order to exert a cable clamping moment on the said jaws;

said link-rods connecting with play to said curved ends of the operating shanks and the piston in such manner as to pivot the jaws into the open position on the displacement of the piston into said grip body without interfering with the action of the cam transmitting the closing force.

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**4,297,952**

## EXPANDABLE TABLE

**David Zagaroli, Hickory, N.C., assignor to Zagaroli & Company, Hickory, N.C.**

**Filed Nov. 19, 1979, Ser. No. 95,253**
**Int. Cl.³ A47B *1/02***
**U.S. Cl. 108—83** **3 Claims**

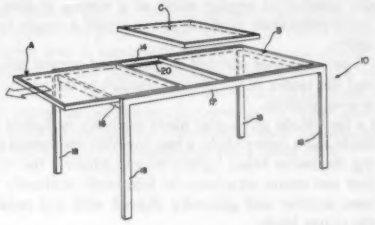
1. An expandable table comprising:

(a) a frame member including a pair of spaced side rails, end rails connecting said side rails, and four legs extending downwardly from the corners of said frame member;

(b) each of said side rails being integrally formed and non-extensible, said side rails each including an inwardly turned flange extending the length thereof;

(c) an expandable table surface including two planar members resting on said flanges and movable between a first, closed position in which said planar members are arranged in co-planar relationship with adjacent edges abutting and a second, open position with said planar members spread apart along said flanges, but still in co-planar relationship;

(d) an auxiliary planar member, similar in appearance to said two planar members and separate from said table when in said first position but inserted between spaced adjacent ends of said planar members when in said second position;



(e) a locking means connecting said side rails and said first two planar members for securing said planar members in said first position and said second position;

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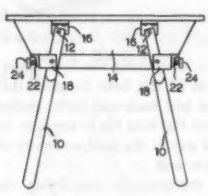
**4,297,953**

## EASILY FOLDAWAY STAND

**Min C. Shy, 20, Alley 18, La. 109, Hoping St., Yong Ho Twon, Taipei Hsien, Taiwan**

**Continuation of Ser. No. 945,998, Sep. 26, 1978. This application Jan. 15, 1980, Ser. No. 112,263**
**Int. Cl.³ A47B *3/08***
**U.S. Cl. 108—131** **5 Claims**



1. An oven or table having relatively deep side walls extending down a substantial distance from an upper edge to a lower surface in combination with an easily foldaway stand comprising at least one pair of legs, means pivotally connecting each of said legs at its upper end to opposite sides of said oven or table adjacent said upper edge whereby said legs may be optionally extended to supporting position or folded to storage position, a horizontally extending bar disposed intermediate opposite ends of each of said legs at a substantial distance down from said upper ends of said legs and secured thereto, said bar being in substantial abutment with said lower surface when said legs are extended, latch means provided at one end of said oven or table for cooperation with said bar to secure said bar to said surface and said pair of legs in upright condition and to impart a significant measure of stability to said legs.

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**4,297,954**

## APPARATUS FOR ATTACHING SLIDE FASTENER ELEMENTS TO FABRIC

**Henry J. Gauthier, Naugatuck, Conn., assignor to Scovill Inc., Waterbury, Conn.**

**Continuation of Ser. No. 43,443, May 29, 1979, abandoned. This application May 9, 1980, Ser. No. 148,582**
**Int. Cl.³ D05B *3/12***
**U.S. Cl. 112—104** **14 Claims**

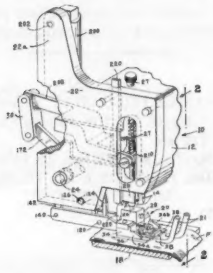
1. An apparatus for sewing a ladder of slide fastener elements directly to the fabric of a garment or the like, the ladder comprising plastic U-shaped fastener elements each comprising a pair of legs and a central bight, the elements being connected and held in spaced relation by a plurality of connecting

cords at least one of which is embedded in each of the legs of the successive elements, the apparatus comprising:

(a) a sewing machine having a vertically reciprocating needle adapted to engage work at a sewing station and a work-supporting platform above which a needle reciprocates;

(b) a pressing foot adapted to guide and present the fabric and the ladder in the desired relation to the needle at the sewing station;

(c) a feed blade and cutter blade assembly including a feed blade and a cutter blade, a base member and means attaching the cutter blade rigidly thereto adjacent the pressing foot and means attaching the feed blade resiliently to the base member and generally aligned with and parallel to the cutter blade;



(d) drive means for driving the feed blade and cutter blade and a portion of the base member thereadjacent in an up-and-down and back-and-forth rectangular pattern of motion so that the feed blade engages successive fastener elements and moves the ladder step-by-step fashion to the sewing station; and

(e) means for momentarily restricting the back-and-forth movement of the base member thereby terminating the feed, and for depressing the base member adjacent the blades below the usual lower limit of up-and-down travel so that the feed blade yields as its engages the connecting cords but the cutter blade moves downward and severs the connecting cords.

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**4,297,955**

**SEWING APPARATUS**

**Edward W. Shaw, 11735 Joseph Casavant, Montreal, Quebec, Canada (H3M 2B9)**

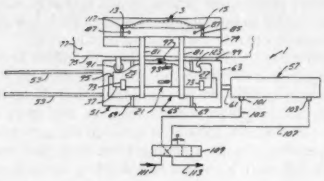
**Filed Sep. 10, 1979, Ser. No. 73,608**

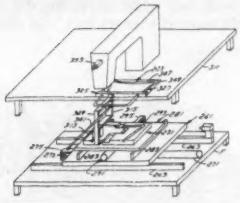
**Claims priority, application United Kingdom, Nov. 18, 1978, 45156/78**

**Int. Cl.³ D05B *21/00***

**U.S. Cl. 112—121.15** **15 Claims**

**1.** An apparatus for use in substantially automatically sewing articles along a symmetrical, open-ended path comprising means for mounting each article on a support, and means for





automatically moving the support to sew along the path from either end of the path to the other end.

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**4,297,956**

**ZIGZAG SEWING MACHINE HAVING BASE-MOUNTED OPERATING ELEMENTS FOR CONTROLLING SEWING**

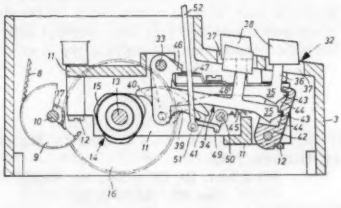
**Willi Meier, Karlsruhe-Durlach, Fed. Rep. of Germany, assignor to Dorina Nähmaschinen GmbH, Fed. Rep. of Germany**

**Filed Sep. 10, 1979, Ser. No. 73,635**

**Claims priority, application Fed. Rep. of Germany, Sep. 14, 1978, 2839963; Sep. 15, 1978, 2840209**

**Int. Cl.³ D05B *3/02***

**U.S. Cl. 112—158 A** **8 Claims**



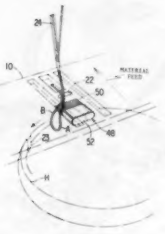
**1.** In a zigzag sewing machine with a multiplicity of scannable control cams which singly or severally together are connectable to transmission elements for adjusting the overstitch width or swing of the needle bar and/or of the feed direction of the fabric feed mechanism by means of a selector containing operating elements which are connected to the control cams and the transmission elements, the improvement comprising, a base portion, bracket means in said base portion mounting said control cams and said selector, said base portion having a wall with a plurality of openings therethrough, and operating elements pivotally mounted in said base portion and having a key part extending through the opening for manipulation to vary the stitch pattern, said wall also having an opening for the selector to pass through so that it may be adjusted manually.

**4,297,957**

## ANTI-HALOING THROAT PLATE

**Stanley J. Ketterer, Jamesburg, N.J., assignor to The Singer Company, Stamford, Conn.**

**Division of Ser. No. 940,935, Sep. 11, 1978, Pat. No. 4,266,494.**
**This application Oct. 17, 1979, Ser. No. 85,458**
**Int. Cl.[3] D05B** *57/08, 73/12*
**U.S. Cl. 112—184** **3 Claims**



**1.** In a sewing machine having a bed, a reciprocatory thread carrying needle and a loop taker located in the bed of said sewing machine for grasping and expanding a loop of thread forming a work limb and a take-up limb as said needle penetrates the material being sewn, an anti-haloing device comprising a throat plate having an aperture formed therein through which said needle traverses, and means on said throat plate for separating said work limb from said take-up limb of said loop of thread and for positively restraining said work limb thereby preventing said work limb from being prematurely drawn through the material being sewn due to friction with said take-up limb, wherein said means comprises a plurality of closely spaced bristles lying parallel to said throat plate and in advance of said needle aperture, said bristles being in such a position as when said loop taker captures and expands said loop of thread, the work limb thereof will be ensnared in said bristles, and will be frictionally retained during cast-off of said loop of said loop taker until the take-up limb is drawn through said aperture through which said needle traverses.

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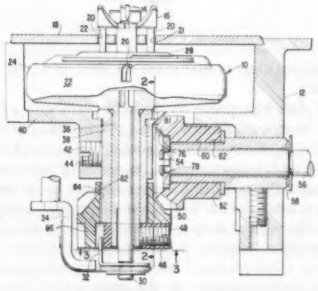
**4,297,958**

## HOOK DRIVE TRAIN FOR A SEWING MACHINE

**Kenneth D. Adams, Madison, N.J., assignor to The Singer Company, Stamford, Conn.**

**Filed Oct. 31, 1979, Ser. No. 89,800**
**Int. Cl.[3] D05B** *57/36*
**U.S. Cl. 112—220** **8 Claims**



**1.** In a drive train for the hook of a sewing machine; and input shaft including a slot which extends diametrically across an end surface of the shaft; an input gear with diametrically opposite slots; a drive key between the input shaft and input gear including a torque transmitting member which is slidable in the shaft slot and permits self adjusting movements of the gear in the direction of such slot, said drive key also including projecting ears which extend in a direction substantially perpendicular to the torque transmitting member and register in the gear slots to provide for self adjusting movements of the gear in a direction perpendicular to the shaft slot; a bushing; a hook drive gear in mesh with the input gear and rotatable on the bushing by said input gear; a drive collar rotatable by the hook drive gear, the collar being connected to the hook drive gear to permit self adjusting movement of the hook drive gear transversely on the bushing; a hook drive shaft rotatable by the collar; and a hook rotatable by the hook drive shaft.

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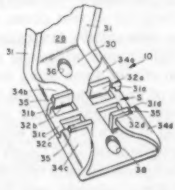
**4,297,959**

## METHOD FOR MAKING CHAIN BRACKET WITH STRENGTHENED CHAIN SUPPORTS

**Charles C. Frost, Ada, and Siegfried K. Weis, Byron Center, both of Mich., assignors to C. L. Frost & Son, Inc., Grand Rapids, Mich.**

**Division of Ser. No. 872,244, Jan. 25, 1978, Pat. No. 4,220,243.**
**This application Jan. 7, 1980, Ser. No. 110,258**
**Int. Cl.[3] B21D** *53/00*
**U.S. Cl. 113—116 HH** **13 Claims**



**1.** A method for forming stamped trolley brackets for use with overhead conveyors comprising the steps of:

(1) stamping a trolley bracket from a sheet of metal including forming one end of said bracket for supporting a trolley wheel, a second end portion for supporting a chain link of a conveyor chain, and an intermediate portion connecting said two end portions;

(2) said forming of said second end portion including bending integrally and in one piece from a portion of the sheet metal of said bracket at least one of a chain pad for supporting a conveyor chain link when mounted thereon and reinforcing means for said chain pad;

(3) bending the other of said chain pad and reinforcing means from said bracket sheet metal such that said reinforcing means will support said chain pad in use and resist bending or deformation from its position when loaded; and

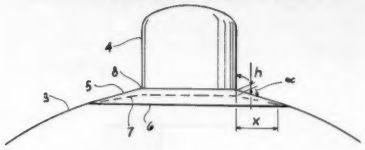
(4) said bending including bending said chain pad from a portion of said sheet metal separate from the portion from which said reinforcing means is bent; said separate chain pad and reinforcing means being bent such that they extend in different planes but engage and abut another after bending whereby said second bracket end portion is ready for receipt of and engagement with a link of a conveyor chain after bending.

**4,297,960**

## TANK WITH A DOME ONBOARD SHIPS

**Arne Tonnessen, Jeloy, Norway, assignor to Moss Rosenberg Verft A.S., Jeloy, Norway**

**Continuation-in-part of Ser. No. 831,917, Sep. 9, 1977, abandoned, which is a continuation of Ser. No. 687,935, May 19, 1976, abandoned. This application Jun. 7, 1979, Ser. No. 46,428**
**Claims priority, application Norway, Jun. 5, 1975, 751986**
**Int. Cl.³ B63B** *25/08;* **B65D** *88/04, 88/12*
**U.S. Cl. 114—74 A** **3 Claims**




1. A closed tank means for transporting liquefied gases on board a marine vessel comprising a spherical tank shell, a frusto-conical transition wall and a dome which has an annular bottom edge portion, said tank shell and said transition wall and said dome all having a common vertical axis, said tank shell being truncated by a horizontal plane across the upper part of the top hemisphere of said tank shell, the portion of the sphere of said tank shell above said horizontal plane comprising a hypothetical extension of said tank shell from said horizontal plane to a height where its diameter is equal to the diameter of said annular bottom edge portion of said dome, said dome being for containing operating equipment for the tank, said frusto-conical transition wall being for securing said dome to said tank shell at said horizontal plane and defining means for increasing the natural frequency of said dome and thereby reducing vibration of said dome, said frusto-conical transition wall being substantially tangential to the upper portion of said tank shell at said horizontal plane, said annular bottom edge portion of said dome being coextensive with the upper edge portion of said frusto-conical transition wall and being attached thereto throughout their respective diameters at a height above that of the top of said hypothetical extension of said sphere, the longitudinal, axial length of said frusto-conical transition wall being substantially less than the longitudinal, axial length of said dome, whereby said frusto-conical transition wall stiffens said dome relative to said tank wall and thereby increases the natural frequency of vibration of said dome to a level above the frequencies of vibration to which said dome would otherwise be subjected while the vessel is at sea.

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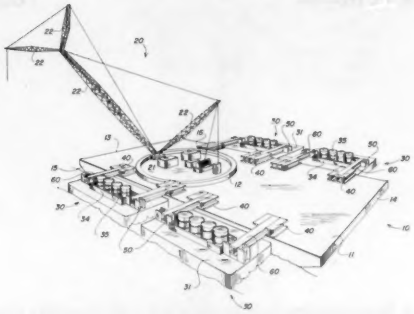
**4,297,961**

## OUTRIGGER-STABILIZED FLOATING CRANE SYSTEM

**Fontain M. Johnson, Jr., St. Louis County, Mo., assignor to Weaver Shipyard and Drydock, Inc., Orange, Tex.**

**Filed Dec. 31, 1979, Ser. No. 108,514**
**Int. Cl.³ B63B** *43/14;* **B66C** *23/52*
**U.S. Cl. 114—123** **22 Claims**

1. A floating crane construction comprising
a crane barge having a crane mounting provision on its upper side, substantially on its longitudinal centerline, in combination with
a pair of outrigger barges, and
outrigger mounting structures, one extending sideward from each side of the crane barge to one of said outrigger barges, each outrigger mounting structure including
connection means for coupling each of the said outrigger mounting structures to an outrigger barge, and
a moment-resisting connection to the crane barge,
whereby listing on increased loading of the crane barge creates a substantially vertical-acting force at the connection means which is resisted by the buoyancy of the outrigger barge,
at least one of said connection means and said moment-resisting connection having a removable pin connector, together with
means to so ballast the outrigger barges that upon normal



loading of the crane barge with a substantially unloaded crane mounted on said crane mounting provision, the draft of both outrigger barges is such as to create substantially no vertical-acting forces at the removable pin connectors,
whereby to facilitate coupling and uncoupling of the outrigger barges.

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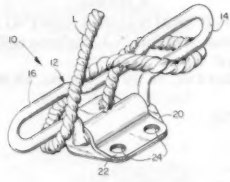
**4,297,962**

## HINGED DECK CLEAT ASSEMBLY

**Curtiss S. Johnson, Jr., Middle Haddam, Conn., assignor to C. Sherman Johnson Company, Inc., East Haddam, Conn.**

**Filed Jul. 3, 1979, Ser. No. 54,473**
**Int. Cl.³ B63B** *21/04*
**U.S. Cl. 114—218** **9 Claims**



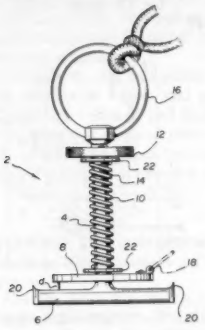

1. A hinged cleat assembly for the deck of a boat or the like comprising:
a base plate mountable on the deck surface of a boat;
a cleat member formed by a rod contoured in the shape of a "T" with two opposed projecting ears extending in opposite directions away from a supporting stem intermediate the ears, the ears being interconnected in the intermediate region and each ear having the shape of an elongated "U" to define a central opening extending into the ear from the intermediate region and to attach to the cleat member a line in a conventional hitch, the ears being contoured at their interconnection in the intermediate region of the cleat member to form an outwardly facing depression on the exterior of the cleat member; and
hinge means connecting the stem of the cleat member to the base plate for pivoting movement of the cleat member between an upright and a flattened position relative to the base plate.

4,297,963

## MOORING DEVICE

Keith I. Beacom, P.O. Box 178, Huntsville, Ontario, Canada (P0A 1K0)

Filed Mar. 2, 1979, Ser. No. 16,800
Int. Cl.[3] B63B *21/00*
U.S. Cl. 114—230 8 Claims




1. A securing device for a dock or the like having spaced decking elements of uniform thickness comprising:

a body of uniform cross-section in rigid T-bar form, having a shaft and an elongated head secured transversely to one end thereof, the head being sufficiently narrow to fit between adjacent elements;

a flat plate mounted on the shaft for slideable movement thereon toward and away from the head;

biasing means associated with the shaft and plate to urge the plate toward the head; and

means for securing a line.

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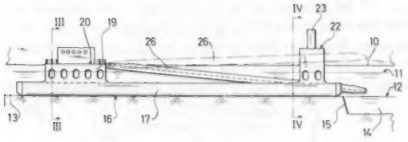
4,297,964

## MOBILE CAISSON STRUCTURE

Said Oleborg, Onsala, Sweden, assignor to Navire Cargo Gear International AB, Göteborg, Sweden

Filed Apr. 3, 1980, Ser. No. 136,902
Claims priority, application Sweden, Apr. 18, 1979, 7903371
Int. Cl.[3] B63B *21/00*
U.S. Cl. 114—263 3 Claims




1. A mobile caisson structure comprising

at least one elongate displacement unit having ballast tanks,

a first housing at one end of said displacement units, said housing having sufficient height to extend above high water level at the location where the caisson is expected to be used with its displacement unit resting upon the sea bottom, said housing having a platform located above said high water level,

a second housing comprising two towers at the opposite end of said displacement unit,

a communication ramp having one end supported by the platform of said first housing, and extending at least to said second housing, and

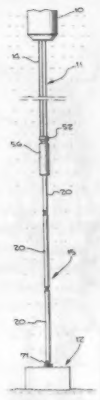
means at said second housing for raising and lowering the adjacent end of said communication ramp.

4,297,965

## TENSION LEG STRUCTURE FOR TENSION LEG PLATFORM

Edward E. Horton, Portuguese Bend, and Raymond W. Walker, Huntington Beach, both of Calif., assignors to Deep Oil Technology, Inc., Irvine, Calif.

Filed Sep. 6, 1979, Ser. No. 73,096
Int. Cl.[3] B63B *35/44*
U.S. Cl. 114—265 8 Claims




1. In combination:

a floatable offshore platform;

a plurality of anchor means adapted to be set on the ocean floor;

a plurality of tension leg means extending between and connected to the platform and to respective anchor means;

each tension leg means including a tension leg structure and tension lines, each leg structure comprising:

a plurality of interconnected independently buoyant members having a buoyancy to provide an essentially free-standing structure;

each buoyant member including a hollow cylindrical member,

a fluid tight bulkhead adjacent each end of said cylindrical member to form a closed buoyant compartment,

and a tremie pipe member within said cylindrical member and extending through said bulkheads in sealed relation therewith and having pipe extensions beyond said bulkheads;

joint means threadedly interconnecting adjacent independently buoyant members in tension force transmitting relation;

the adjacent pipe extensions of said tremie pipe members having a coupling providing fluid communication therebetween within said joint means;

a buoyant cylinder means carried by each of the uppermost of said independently buoyant members to provide additional positive buoyancy to support said plurality of buoyant members in such freestanding relation;

a crosshead means carried by said uppermost buoyant member;

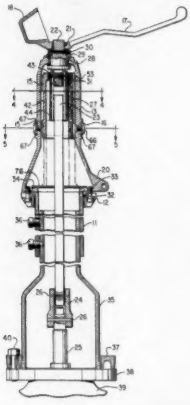
said tension lines having lower ends positionable and connectible in force transmitting relation with said crosshead means and adapted to extend to said platform;

said tension lines in non-force transmitting relation being supported by said buoyant members and cylinder means and lying alongside said buoyant members.

## 4,297,966
## VALVE INDICATOR POST

Richard Liberman, 4400 Montclair Ave., Montreal, Quebec, Canada

Filed Oct. 15, 1979, Ser. No. 85,141
Claims priority, application Canada, Oct. 18, 1978, 313675
Int. Cl.³ F16K *37/00*
U.S. Cl. 116—277 7 Claims



1. An indicator post for operating a valve stem of a remote valve and for indicating the position of the valve, said post comprising:

a cylindrical outer casing having a detachable cap, the cap having at least two curved viewing ports extending in a single curve therearound and having an upper surface;

a rotatable stem adapter positioned through the upper surface;

an operating member in the cap connected to said stem adapter for rotation therewith;

a stem member in the casing linking for rotation said operating member to the valve stem;

a curved target carrier located in the cap, said carrier adapted to move axially within the cap in response to rotation of said operating member, said carrier having an outer surface;

a first and a second target strip, each strip having a valve position indication thereon with the indication on said first strip different from the indication on said second strip, said first and second strips removably wrapped about the outer surface;

fastening means for mounting said first and second strips in any vertical position along the axial length of the outer surface with said second strip at a location on the outer surface different from the location of said first strip; and,

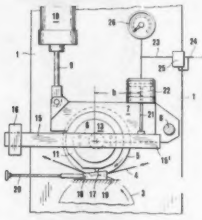
means for axially moving said carrier and said first and second strips past the viewing ports as said stem adapter is rotated, with said means threadably engaging said carrier to said operating member

whereby when either said first or said second strip is in alignment with said ports the valve position indication thereon is visible for almost 360° around said post.

## 4,297,967
## DEVICE FOR APPLYING AN OPERATING PRESSURE TO A ROLLER

Francesco Osta, 3, via Spanzotto, I-15033 Casale Monferrato, Italy

Filed Jan. 15, 1980, Ser. No. 112,320
Claims priority, application Italy, Feb. 2, 1979, 67228 A/79
Int. Cl.³ B05C *11/02*
U.S. Cl. 118—117 10 Claims



9. A spreading unit, comprising a structure, a spreading roller pivoted on said structure, motor means connected to said spreading roller, support levers pivoted on said structure, drive means connected to said support levers and structure for displacing said support levers, stop means on said structure for determining an operating position of said support levers, support bushings rotatably mounted on said support levers, bearings eccentrically mounted on said bushings, a pressure roller pivoted in said bearings and cooperating as a counterroller with said spreading roller, bars connected to said bushings and means for applying an operating pressure, connected to said bars.

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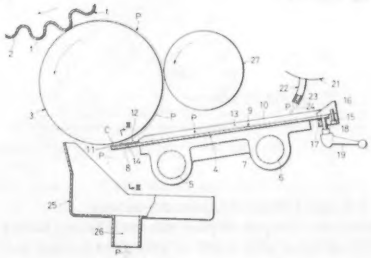
## 4,297,968
## DEVICE FOR SPREADING PASTE ON PAPERBOARD IN A CORRUGATED BOARD MANUFACTURING APPARATUS

Eiichi Isowa, Nagoya, Japan, assignor to Isowa Industry Co., Ltd., Japan

Filed Jan. 31, 1980, Ser. No. 117,074
Int. Cl.³ B05C *1/08, 1/16*
U.S. Cl. 118—249 9 Claims



1. In a corrugated board manufacturing apparatus, a device for spreading paste on tops of corrugated core paper to be pasted with linerboard, said device comprising:

a supplier for supplying liquid paste;

a roller spaced from said supplier to face said tops of said core paper for spreading said liquid paste thereon;

means provided opposite to said paste spreading roller for controlling the volume of said liquid paste;

paste means provided under said supplier downwardly inclining toward said paste spreading roller and having a forward end in proximity with said paste spreading roller

to define a passage for continuously flowing said liquid paste supplied from said supplier past said paste spreading roller;

said paste feeding means comprising:

at least a pair of end plates oppositely provided in the forward end of and on top of said paste feeding means defining a certain clearance between the upper surfaces thereof and said paste spreading roller, said end plates being longitudinally movable with respect to the roll axis of said paste spreading roller; and whereby

a feed portion is defined by said end plates and communicates with said passage in which said paste spreading roller dips up paste, the width of said feed portion being adjustable by movement of said end plates in conformity with the width of said core paper between a minimum effective width and a maximum effective width.

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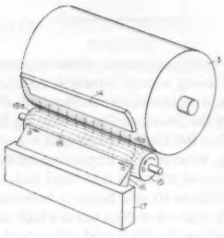
**4,297,969**

## MAGNETIC POWDER TRANSPORTING DEVICE

**Akiyoshi Torigai, Machida, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Oct. 30, 1979, Ser. No. 89,369**
**Claims priority, application Japan, Nov. 10, 1978, 53-137834**
**Int. Cl.³ G03G *15/06***
**U.S. Cl. 118—652** **14 Claims**



1. A transporting device for transporting magnetic powder with magnetic force, comprising:

transport means provided with a magnet having principal magnetic poles for transporting the magnetic powder; and

drive means for driving said transport means, wherein said magnet has magnetic field generating portions provided at the end portions thereof for displacing the magnetic powder toward the internal portions of the magnet by magnetic force, said magnetic field generating portions being composed of a part of each of said principal magnetic poles, and wherein each said part is inclined with respect to the remaining part of each of said principal magnetic poles.

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**4,297,970**

## DEVELOPING APPARATUS

**Hatsuo Tajima, Matsudo; Nagao Hosono, Chofu, and Junichiro Kanbe, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Mar. 3, 1980, Ser. No. 126,865**
**Claims priority, application Japan, Mar. 9, 1979, 54-27327**
**Int. Cl.³ G03G *15/06, 15/09***
**U.S. Cl. 118—652** **14 Claims**

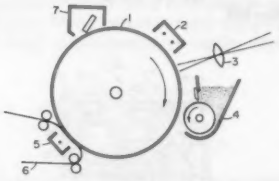
1. A developing apparatus for developing an electrostatic latent image formed on an electrostatic image bearing means, by providing said latent image with a developer, said apparatus comprising:

a movable toner bearing member for carrying thereon a magnetic toner;

toner supply means for supplying magnetic toner to said toner bearing member;

magnetic field generating means fixedly provided inside said toner bearing member; and

a toner thickness limiting member comprising a magnetic material positioned within the extent of a magnetic field generated by a magentic pole of said magnetic field generating means and in the vicinity of the external periphery of said toner bearing member;



wherein said magnetic toner is provided with a mean particle size in a range of 5 to 30 microns and contains magnetic powder in a range of 15 to 50 wt.%, and wherein the magnetic pole of said magnetic field generating means is so selected as to maintain a magnetic field of at least 1350 gauss in average between said toner thickness limiting member and said toner bearing member thereby forming the toner layer of a determined thickness on said toner bearing member.

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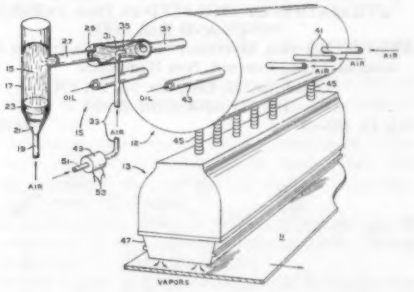
**4,297,971**

## APPARATUS FOR VAPORIZING SOLID COATING REACTANTS

**Vern A. Henery, Plum Borough, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.**

**Division of Ser. No. 836,177, Sep. 23, 1977, Pat. No. 4,182,783.**
**This application Sep. 12, 1979, Ser. No. 74,582**
**Int. Cl.³ C23C *11/00, 13/12***
**U.S. Cl. 118—719** **7 Claims**



1. In an apparatus for coating a substrate with a film by deposition from a vaporous reactant composition comprising means for vaporizing a particulate solid coating reactant by directing a hot gas over the reactant and means for directing the reactant-gas composition into contact with the substrate to be coated, which substrate is maintained at a sufficient temperature for causing the reactant to react at the substrate surface to form a film thereon, the improvement which comprises

means for fluidizing a mass of particulate solid reactant by introducing a volume of fluidizing gas through such a mass;

means for drawing a volume of fluidized particulate solid reactant and fluidizing gas through an enclosure and for heating an additional volume of gas and mixing the additional volume of gas therewith; and

means for heating the mixture to a sufficient temperature to

vaporize the fluidized particulate solid reactant to provide the reactant-gas composition.

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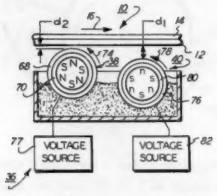
**4,297,972**

## DEVELOPMENT SYSTEM

**Stephen C. P. Hwa, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.**

**Filed Nov. 5, 1979, Ser. No. 91,296**
**Int. Cl.³ G03G *15/09***
**U.S. Cl. 118—658** **8 Claims**




1. An apparatus for developing a latent image, including:

means for transporting a conductive developer material comprising a ferromagnetic carrier material and marking particles into contact with the latent image at least two successive times,

means for generating a first magnetic field for attracting the carrier material to maintain the developer material at a first conductivity to optimize development of solid areas with the marking particles the first contact time, and

means for generating a second magnetic field for attracting the carrier material to maintain the developer material at a second conductivity lower than the first conductivity to optimize development of lines with the marking particles the last contact time.

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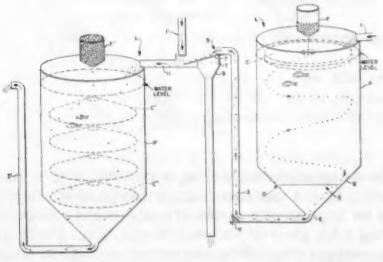
**4,297,973**

## PROCESS AND APPARATUS FOR INCREASING THE UTILIZATION OF FISH FEED IN FISH FARMING PONDS AND THE LIKE

**Albert H. Knowles, Inverness, Scotland, assignor to K. R. Associates Inc., Concord, New Hampshire**

**Filed Apr. 21, 1980, Ser. No. 141,771**
**Int. Cl.³ A01K *61/02, 63/00***
**U.S. Cl. 119—3** **30 Claims**



1. A process for increasing the utilization of fish feed, that comprises, separately applying inlet water to a plurality of successive fish ponds; introducing fish feed into at least one of said ponds and circulating the same about the pond as the feed drops under gravity toward the bottom of said pond; carrying uneaten feed at the said bottom of the pond upward with the pond waste water towards the top of an adjacent pond while retaining the fish in the pond; ejecting the waste water while screening therefrom the carried uneaten feed; and imparting momentum to such feed to carry the same into the said adjacent pond to be circulated about said adjacent pond by the inlet water applied thereto.

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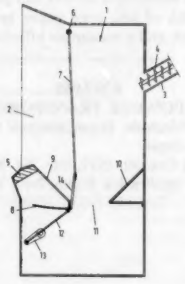
**4,297,974**

## AUTOMATIC FEEDING APPARATUS

**Gerardus W. Poiesz, Warnsveld, Netherlands, assignor to Brinkmann En Niemeyer N.V., Zutphen, Netherlands**

**Filed Jan. 30, 1980, Ser. No. 116,991**
**Claims priority, application Netherlands, Feb. 1, 1979, 7900834**
**Int. Cl.³ A01K *5/02***
**U.S. Cl. 119—51 R** **6 Claims**



1. Livestock feeding apparatus of the type having:

(a) a housing having a head insertion opening; and

(b) dosing means responsive to the presence of selected specimens of the livestock for presenting food within said housing so that the food so presented is accessible through said opening, wherein the improvement comprises:

(c) a valve mounted adjacent said head insertion opening for movement relative to said housing between an open position in which said valve does not occlude said opening and a closed position in which said valve occludes said opening;

(d) valve opening means responsive to the presence of said selected specimens of the livestock for moving said valve from said closed position to said open position; and

(e) valve closing means for returning said valve from said open position to said closed position when a predetermined period of time has elapsed after movement of said valve to said open position.

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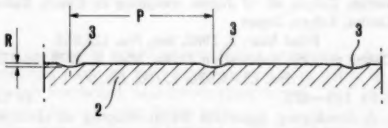
**4,297,975**

## DEVICE FOR IMPROVING THE LUBRICATION IN A ROTARY COUPLING

**Ercole Galli, Turin, Italy, assignor to Mondial Piston - Dott. Galli Ercole & C. S.p.A., Turin, Italy**

**Filed Jan. 16, 1979, Ser. No. 3,952**
**Claims priority, application Italy, Jun. 14, 1978, 68373 A/78**
**Int. Cl.³ F02F *3/00***
**U.S. Cl. 123—193 P** **4 Claims**




1. In a piston for an internal combustion engine, having bosses and in said bosses holes intended to receive a piston pin, of the type in which the piston pin is lubricated only by sprayed lubricating oil reaching the piston pin surface by passing between the piston bosses and a connecting rod and then penetrating between the piston and the piston pin; the improve-

ment that at least a portion of the concave surface of said holes has hollowed therein a number of turns of circumferential grooving having a depth ranging between 2 μm and 50 μm, whereby a capillary channel for lubricating oil is formed.

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**4,297,976**

## PISTON AND CYLINDER ASSEMBLIES

**Ludovico Bruni, and Pierantonio Iguera, both of Turin, Italy, assignors to Associated Engineering, Italy, S.p.A., Turin, Italy**

**Filed May 31, 1979, Ser. No. 44,074**

**Claims priority, application United Kingdom, May 31, 1978, 25336/78**

**Int. Cl.³ F02F *1/00***

**U.S. Cl. 123—193 CP** **11 Claims**

1. A piston and cylinder assembly in which the piston is made of an aluminium alloy characterised in that after any temporary running-in coating on the wall of the cylinder has been worn away, the piston is in direct running contact with a cylinder wall formed of a hypereutectic silicon aluminium alloy consisting essentially of the following in percentages by weight:

silicon 12–20%; copper 0.5–5%; iron 1.0–6%; magnesium 0.2–2%; nickel 0.5–4%; and optionally manganese 0–5%; cobalt 0–3%; chromium 0–3%; tin 0–8%; titanium 0–0.3%; lead 0–5%; and molybdenum 0–5%, the remainder being aluminium.

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**4,297,977**

## IGNITION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

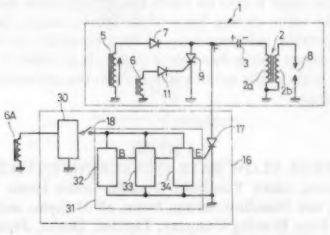
**Kimihiro Boyama, Shizuoka, Japan, assignor to Kokusan Denki Co., Ltd., Numazu, Japan**

**Filed Jan. 18, 1980, Ser. No. 113,355**

**Claims priority, application Japan, Jan. 19, 1979, 54-5500[U]**

**Int. Cl.³ F02B *31/00***

**U.S. Cl. 123—320** **4 Claims**




1. An ignition system for an internal combustion engine having a throttle valve operated by a throttle valve operating member, the ignition system comprising an ignition circuit to generate a spark at an ignition plug in synchronism with the rotation of the internal combustion engine, said ignition system further comprising an ignition preventing circuit to prevent said ignition circuit from being operated when the internal combustion engine is being rotated at a speed of revolution higher than a first set value of revolutions per minute while said throttle valve operating member is returned to a position at which the internal combustion engine is to be rotated at a speed of revolution lower than a second set value of revolutions per minute which is lower than said first set value of revolutions per minute, said ignition preventing circuit comprising an ignition preventing semiconductor switch provided in said ignition circuit to prevent said ignition circuit from being operated when said ignition preventing semiconductor switch is operated, and a control signal generator provided to supply a control signal to said ignition preventing semiconductor switch at a given period when the internal combustion engine is being rotated at a speed of revolution higher than said first set value while said throttle valve operating member is returned to said position corresponding to a speed of revolution lower than said second set value, said ignition preventing circuit further comprising a throttle position detecting switch to detect the position of said throttle valve operating member, said control signal generator comprising an electric source to generate an output voltage increasing with the revolutions per minute of the engine and to rectify said output voltage into a DC voltage, a pulse generating circuit to receive said DC voltage to generate a pulse signal having a constant period, and said pulse generating circuit being connected to said ignition preventing semiconductor switch to apply said pulse signal as said control signal to said ignition preventing semiconductor switch.

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**4,297,978**

## IDLING ROTATIONAL SPEED CONTROL SYSTEM FOR A DIESEL ENGINE

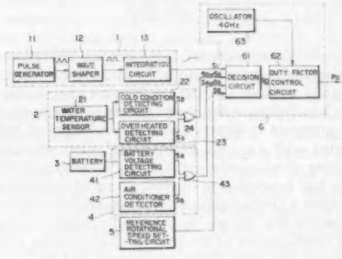
**Katsuhiko Matsui, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan**

**Filed Dec. 26, 1979, Ser. No. 107,458**

**Claims priority, application Japan, Jan. 18, 1979, 54-3359**

**Int. Cl.³ F02M *51/06***

**U.S. Cl. 123—339** **18 Claims**




1. An idling speed control system for a diesel engine comprising:

(a) an engine speed sensor for determining engine speed and producing a first sensor signal indicating the determined engine speed;

(b) an engine temperature sensor for determining engine temperature and producing a second sensor signal when the determined engine temperature is not in a predetermined temperature range;

(c) a battery voltage sensor determining battery voltage and producing a third sensor signal when the battery voltage drops below a predetermined level;

(d) a target engine speed determining means for determining a target engine speed and producing a reference signal indicative of the determined target engine speed;

(e) an engine speed setting circuit setting the engine speed to a predetermined speed and producing a fourth signal representative of the set speed, which, when the value of said first sensor signal is less than that of said reference signal, is set to step up the engine speed so that the engine speed becomes equal to the target engine speed, and when the engine is idling and at least one of said second and third sensor signals is inputted, said engine speed setting circuit sets the engine speed to another and increased predetermined speed to step up the engine speed so that the engine speed is accelerated to said another predetermined speed;

(f) a control means responsive to said fourth signal and controlling the amount of the fuel supplied to the engine.

4,297,979

## SPLIT CONTROL RACK

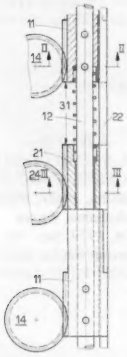
Ewald Kamleitner, Friedrichshafen, Fed. Rep. of Germany, assignor to Motoren- und Turbinen-Union Friedrichshafen GmbH, Friedrichshafen, Fed. Rep. of Germany

Filed May 14, 1979, Ser. No. 38,713

Claims priority, application Fed. Rep. of Germany, May 13, 1978, 2821161

Int. Cl.[3] F02D 17/00

U.S. Cl. 123—372 7 Claims




1. A split control rack for controlling an operation of a series of fuel injection pump means which are respectively associated with cylinders of an internal combustion engine, the split control rack including a first control rack section associated with a first group of cylinders and a second control rack section associated with a second group of cylinders, the split control rack being displaceably actuated by a control member such that the fuel is supplied to the first group of cylinders in dependence upon a displacement of the first control rack section and fuel is supplied to the second group of cylinders in dependence upon a displacement of the second control section rack, characterized in that each of the two control rack sections includes a plurality of individual cylindrical segments each being respectively associated with one of the fuel injection pump means, each of the individual segments is provided with one of serrations and guide levers for actuating the respective fuel pump means associated with the individual segments a first rod is provided for connecting each of the individual sections of the first control rack section together, means are provided in each of the individual segments of the second control rack section for enabling a displaceable mounting of the individual segments of the second rack section on the first rod, a second rod is provided for connecting each of the individual segments of the second control rack section together, and in that recess means are provided in each of the individual segments of the second control rack section for guidingly accommodating the first rod connecting the individual segments of the first control control rack section together.

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4,297,980

## MOTOR VEHICLE CARBURETOR CHOKE MECHANISM

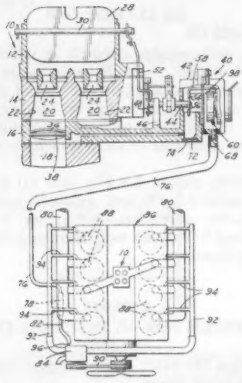
Andrew G. Bellis, Plymouth Township, Wayne County, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Apr. 10, 1980, Ser. No. 138,955

Int. Cl.[3] F02B 7/00, 75/10

U.S. Cl. 123—438 5 Claims

1. A dual-stage vacuumless automatic choke mechanism for use with an engine mounted carburetor having an air/fuel induction passage and an unbalance mounted choke valve rotatably mounted for a variable movement across the passage between an open and closed position to control flow through the passage, the choke mechanism including a housing having an air inlet and outlet, a thermostatic spring means mounted in the housing and operably connected to the choke valve urging the choke valve towards a closed position with a force increasing as a function of decreases in the temperature of the spring means from a predetermined level, the one stage including an engine driven air pump providing a source of air, under pressure that varies with changes in engine speed, conduit mens connecting the air under pressure from the pump to the choke housing inlet, and engine stove means associated with the conduit means for heating the air under pressure prior to entry into the housing whereby the heat is transferred to the spring



means for warming the same to reduce its choke valve closing force and permit opening of the choke valve by air flow thereagainst, the other stage comprising electrical heater mens in the housing operably associated with the spring means for transferring its heat output to the spring means independently of the one stage means to warm the spring means and reduce the choke valve closing force of the spring means, each stage being operably independently of the operability of the other stage to assure a slow movement of the choke valve to its open position without the use of vacuum from the carburetor induction passage.

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4,297,981

## FUEL FLOW RATE MEASURING DEVICE

Kei Kimata, Aichi; Yoshinobu Yasuda, Iwata; Isamu Yoshida, Iwata, and Masahiro Saruta, Iwata, all of Japan, assignors to NTN Toyo Bearing Company, Limited, Osaka, Japan

Division of Ser. No. 893,681, Apr. 5, 1978, Pat. No. 4,184,505.

This application Aug. 17, 1979, Ser. No. 67,453

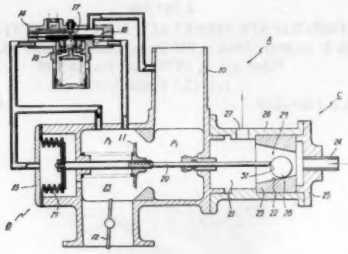
Claims priority, application Japan, Apr. 5, 1977, 52-42899[U]; May 6, 1977, 52-57857[U]; May 7, 1977, 52-57653[U]

Int. Cl.[3] F02D 9/12

U.S. Cl. 123—454 1 Claim

1. A fuel flow rate measuring device for use with an internal combustion engine comprising a flow rate measuring section including a body having a bore whose cross-section is not uniform in the longitudinal direction, a fuel inlet communicating with said bore and a fuel outlet communicating with said bore, and a ball placed in said bore; a control rod, the clearance between said bore and ball being adjustable in accordance with an axial movement of said control rod; a pressure regulator communicating with said fuel inlet and outlet for keeping constant the pressure difference between said inlet and outlet sides, the arrangement being such that the axial position of said control rod and the rate of flow of the fuel correspond to each other in a fixed relation; a sensor means for detecting the operating conditions of the internal combustion engine to produce a control signal in response to said operating conditions, a variable choke operatively positioned in at least one of a fuel supply channel and a fuel return channel of the internal

combustion engine and connected to provide a control input to said pressure regulator; and a controller responsive to said



control signal for controlling the degree of opening of said variable choke to thereby provide supplementary control of said pressure regulator.

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**4,297,982**

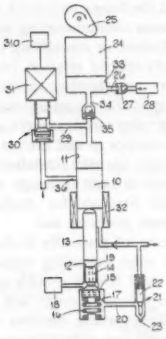
## FUEL INJECTION PUMPING APPARATUS

**Paul Lakra, Wembley, England, assignor to Lucas Industries Limited, Birmingham, England**

**Filed Apr. 17, 1980, Ser. No. 141,158**

**Int. Cl.³ F02D** *1/02, 5/02*

**U.S. Cl. 123—502** **9 Claims**



**1.** A fuel injection pumping apparatus for supplying fuel to an injection nozzle of an internal combustion engine comprising piston means contained within a bore, an outlet from one end of the bore, said outlet in use communicating with an inlet of the nozzle, a fuel inlet to said one end of the bore connected in use to a source of fuel under pressure, a valve operable to prevent flow of fuel through said inlet during delivery of fuel through said outlet, a reciprocable plunger contained within a cylinder, cam means for urging the plunger towards one end of the cylinder, passage means connecting said one end of the cylinder with the other end of said bore whereby liquid displaced during movement of the plunger by the cam will act on said piston means to urge the piston to displace fuel through said outlet, a non-return valve in said passage means to prevent flow of liquid from said bore to said cylinder, a solenoid controlled valve operable to allow flow of liquid from the other end of said bore, a transducer for providing a signal indicative of the position of said piston means, a control circuit for controlling the operation of said valve, said control circuit receiving the signal from the transducer, first means for providing a demand signal to said control circuit, second means for providing an engine speed signal to said control circuit, third means for providing an engine position signal to the control circuit, whereby during movement of the plunger by the cam the valve is closed at a position to cause delivery of fuel at the desired time, and whereby during filling of the bore, the valve is closed when the piston means attains a position appropriate to the amount of fuel to be delivered to the engine.

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**4,297,983**

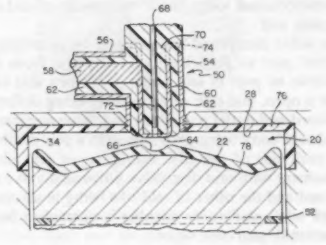
## SPHERICAL REENTRANT CHAMBER

**Michael A. V. Ward, 20 Marrett Rd., Lexington, Mass. 02173**

**Filed Dec. 11, 1978, Ser. No. 968,367**

**Int. Cl.³ F02P** *1/00*

**U.S. Cl. 123—536** **16 Claims**



**1.** In a combustion system including a combustion chamber having a cylindrical configuration, including opposite end walls means for introducing a combustible mixture into said chamber, means for igniting said mixture, moveable means for compressing the mixture and means for conducting to said chamber electromagnetic energy at a microwave frequency, the improvement wherein said frequency and the configuration of said chamber are selected such that a cylindrical resonant cavity mode is substantially continuously excited in said chamber by said energy during combustion of said mixture, said mode being one wherein the electric field strength is largest in the region of the initial flame zone and falls off to lower strength in the region of fully developed flame. and one of said end walls includes a non flat surface so that the shift of the resonant frequency at which combustion occurs, with movement of the movable means, is reduced.

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**4,297,984**

## AIR-FUEL MIXTURE CONTROL VALVE ASSEMBLY

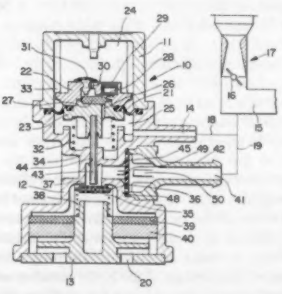
**Yasuhiro Kawabata, Anjo, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan**

**Filed Oct. 9, 1979, Ser. No. 82,529**

**Claims priority, application Japan, Oct. 9, 1978, 53/139017[U]**

**Int. Cl.³ F02M** *23/04*

**U.S. Cl. 123—587** **5 Claims**



**1.** An air-fuel mixture control valve assembly for automotive vehicles in association with an intake manifold, comprising:

a body provided with an inlet port and an outlet port each connected to said intake manifold, and an atmospheric air port normally supplied with atmospheric air,

diaphragm means disposed in said body and movable in accordance with negative pressure in said intake manifold admitted through said inlet port,

a valve member interposed between said atmospheric air port and said outlet port to interrupt communication between said atmospheric air port and said outlet port when the negative pressure in said intake manifold is below a predetermined value and permitting said communication when said negative pressure increases above a predetermined value due to movement of said diaphragm means, and

a disc valve interposed between said valve member and said outlet port to permit only an air flow from said atmospheric air port to said outlet port when said valve member is open, said disc valve member being deflectable only toward said outlet port when said valve member is opened and said body being provided with a pair of ribs disposed at each side of said disc valve, one of said ribs being in abutment with said disc valve when said valve member is closed and the other of said ribs being in abutment therewith when said valve member is opened to limit the deflection of said disc valve.

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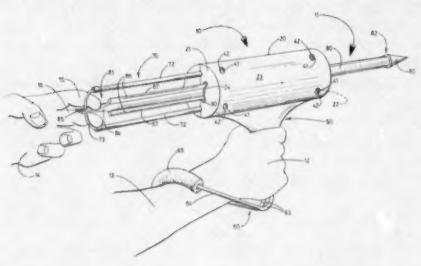
**4,297,985**

## CATAPULT DEVICE AND PROJECTILE THEREFORE

**Rudolph Rodriguez, P.O. Box 423, Fowler, Calif. 93625**

**Filed Dec. 3, 1979, Ser. No. 99,743**
**Int. Cl.³ F41B** *7/00*
**U.S. Cl. 124—22** **4 Claims**



1. A catapult device and projectile therefore comprising a body member, having opposite proximal and distal ends, intersected by a passage extending along an axis through the body member interconnecting said proximal and distal ends, said passage having slots extending radially in a pattern relative to said axis of the passage and extending the entire length of the passage; a grip mounted on the body member; a resilient band mounted on the proximal end of the body member; a projectile of greater length than the passage of the body member, having opposite proximal and distal end portions, transversely dimensioned to be slidably received in the passage and having fins extending radially therefrom in a pattern matching the slots of the body member and extending substantially the entire length of the projectile tapering outwardly therefrom from the distal end portion to the proximal end portion and the fins at said proximal end portion extending radially therefrom a distance nearly equivalent to that of said slots; and a head borne on the distal end portion of the projectile having a transverse dimension greater than at least one transverse dimension of the passage of the body member permitting said projectile to be slidably received in the passage of the body member and retracted by its proximal end portion against the resilient band until the head contacts the distal end of the body member to place the resilient band under tension limited by the contact of the head with the distal end of the body member for release at a velocity controlled thereby along a course controlled by passage of the fins of the projectile in the slots of the body member.

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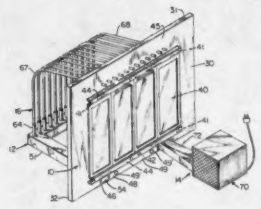
**4,297,986**

## FORCED AIR FIREPLACE HEATING SYSTEM

**Joseph E. Lehrer, 3696 S. Hibiscus, Denver, Colo. 80237**

**Filed Jul. 9, 1979, Ser. No. 56,089**
**Int. Cl.³ F24B** *7/00*
**U.S. Cl. 126—121** **11 Claims**



1. A heating system adapted for installation in a fireplace wherein said fireplace includes a firebox communicating with an upper flue and a lower fuel-supporting member positioned in said firebox, said system comprising:

(1) a lower, substantially horizontally extending plenum disposed around the lower periphery of said firebox;

(2) air-delivery means communicating with said plenum;

(3) a plurality of forced air circulating tubes extending upwardly in closely-spaced relation from communication with said plenum and extending substantially horizontally over said fuel-supporting member toward the entrance to said firebox, said tubes terminating in open-ended exhaust portions at the entrance to said firebox whereby air delivered to said plenum by said air-delivery means is forced through said tubes in heat exchange relation to the heat generated in said fireplace for discharge through said open-ended exhaust portions; and

(4) said plenum being of generally U-shaped configuration having opposite sides extending rearwardly away from the entrance to said fireplace with one side projecting rearwardly from the entrance to said firebox along one side of said fuel-supporting member and having an air intake end on said one side communicating with said air-delivery means, an intermediate portion extending between the rearward ends of opposite sides of said plenum, opposite sides of said plenum having open ends, one of said open ends being in communication with said air delivery means, and a removable closure across the other of said open ends.

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**4,297,987**

## HEAT EXCHANGE SYSTEM

**Lawrence C. Bushee, Florence, Ala., assignor to Amana Refrigeration, Inc., Amana, Iowa**

**Filed May 11, 1979, Ser. No. 38,089**
**Int. Cl.³ F24H** *1/00*
**U.S. Cl. 126—351** **11 Claims**

1. A heat exchanger system for heating air within an enclosure, comprising:

(a) a heat exchanger containing a fluid;

(b) a burner positioned in the heat exchanger for heating the fluid;

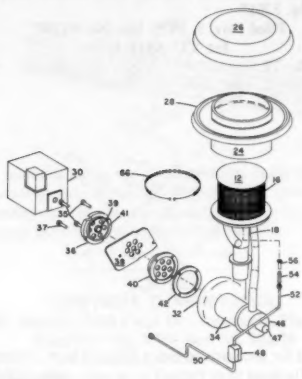
(c) means for transferring heat from the heated fluid to air within the enclosure for heating the air;

(d) means for supplying fuel to the burner;

(e) means for moving a fuel-air mixture formed from the fuel

and an available air supply to the burner for combustion; and

(f) a deformable planar member associated with the means



for moving the fuel-air mixture, for metering and mixing fuel with the air and forming a seal such that a predetermined quantity of air may be supplied to the burner for combustion.

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**4,297,988**

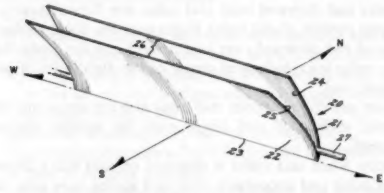
**SOLAR ENERGY COLLECTOR**

**Wallace G. Hanson, Rte. 2, Box 103, Dodge Center, Minn. 55927**

**Filed Feb. 16, 1979, Ser. No. 12,838**

**Int. Cl.³ F24J *3/02***

**U.S. Cl. 126—439** **2 Claims**



1. In a solar collector having a reflector for concentrating rays and an energy receiver, in combination:

a reflector defined by the opposed surfaces of a pair of intersecting cylindrical paraboloids, one of said surfaces being concave and the other being convex,

the paraboloids intersecting in a line, the line of intersection being substantially horizontal,

said surface defining, in a plane perpendicular to their line of intersection, portions of a pair of intersecting identical parabolas having vertical directrices, and having foci spaced along a line in said plane making, with the horizontal, an angle equal to half the maximum solar altitude at the location of the reflector,

said surfaces terminating, remotely from the intersection of said parabolas, at the points where the tangents to said parabolas make, with the horizontal, angles equal to half said maximum solar altitude, to define the entrance aperture of the reflector.

**4,297,989**

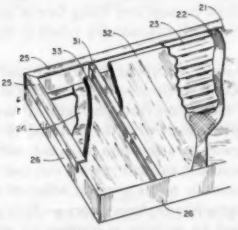
**SOLAR HEAT COLLECTOR**

**Philip A. Wozny, 405 Shepherd Ave., Cambridge, Md. 21613, and Jerome L. Wozny, 6174 Elm St., Omaha, Nebr. 68106**

**Continuation-in-part of Ser. No. 88,341, Oct. 26, 1979, abandoned. This application Apr. 17, 1980, Ser. No. 111,114**

**Int. Cl.³ F24J *3/02***

**U.S. Cl. 126—441** **5 Claims**



1. An improved solar heat collector of the type having a light admitting layer and an energy absorbing layer wherein the improvement comprises a wire mesh screen positioned between said light admitting layer and said energy absorbing layer, said screen having a light reflecting lower surface proximal said energy absorbing layer and an upper darkened light absorbing surface, and an air flow means directed over at least one surface of said energy absorbing layer.

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**4,297,990**

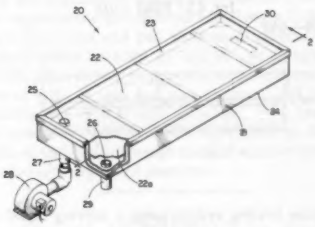
**SOLAR COLLECTOR**

**John H. Allisbaugh, Indianapolis, Ind., assignor to HowAll Products, Inc., Indianapolis, Ind.**

**Filed Mar. 8, 1979, Ser. No. 18,652**

**Int. Cl.³ F24J *3/02***

**U.S. Cl. 126—445** **4 Claims**



1. A portable, modular, air-to-air solar energy collector for introducing and adding heat to a circulating flow of air, said solar energy collector comprising:

a generally rectangular, free-standing, frame-like enclosure having a back panel, a surrounding side wall, and an enclosing light-transmissive outer panel, the combination of said back panel, said surrounding side wall, and said enclosing light-transmissive outer panel defining an enclosed air space interior thereto;

a solar radiation absorbing plate disposed within said frame-like enclosure, said solar radiation absorbing plate having a radiation-facing top surface and a finned bottom surface, and being suitably arranged to segment said enclosed air space into two air flow passageways;

an air inlet conduit extending from a location exterior of said frame-like enclosure through said back panel and through said solar radiation absorbing plate, said air inlet conduit being suitably adapted for connection to a source of air at a location exterior of said frame-like enclosure;

an air outlet conduit extending from a location exterior of said frame-like enclosure through said back panel, said air outlet conduit being suitably adapted for flow connection to a remote use location for utilization of any exiting air;

said solar radiation absorbing plate and said light-transmissive outer panel defining a first air flow passageway across the top surface of said solar radiation absorbing plate, said first air flow passageway having an inlet end in communication with said air inlet conduit and an opposite exit end, said first air flow passageway being free of any intermediate structures which functionally relate to the transfer of heat; and

said solar radiation absorbing plate and said back panel defining a second air flow passageway across said bottom surface, said second air flow passageway having an inlet end in communication with the exit end of said first air flow passageway at a location adjacent one end of said frame-like enclosure and an opposite exit end in communication with said air outlet conduit adjacent the opposite end of said frame-like enclosure, said air flow passageways being arranged to provide a continuous, singular flow path from said air inlet conduit to said air outlet conduit.

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**4,297,991**

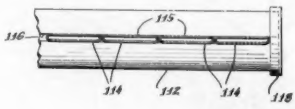
## SOLAR COLLECTOR DEVICE

**Anthony Easton, Old Saybrook, Conn., assignor to National Solar Corporation, Centerbrook, Conn.**

**Continuation of Ser. No. 936,192, Aug. 24, 1978, abandoned, which is a division of Ser. No. 795,143, May 9, 1977, abandoned, which is a continuation-in-part of Ser. No. 690,362, May 26, 1976, abandoned. This application May 20, 1980, Ser. No. 151,656**

**Int. Cl.³ F24J** *3/02*

**U.S. Cl. 126—448** **1 Claim**




1. In a solar heating system using a moving liquid medium for collecting heat energy as the liquid medium flows through a solar energy collector device, the improvement in said collector device comprising:

(a) a substantially continuous planar surface for collecting solar energy provided exclusively by a plurality of tubes formed from copper tubing with not more than 4.0 percent iron which has been flattened to substantially its maximum diameter to provide two flat faces with an intervening flat passageway for the liquid medium, said passageway having a smooth uninterrupted surface of uniform thickness, and said tubes being disposed in diametric abutting relation to one another to present said substantially continuous planar surface for collecting solar energy;

(b) a first header member having a longitudinal slot into which one end of the flattened and abutting tubes is inserted and connected thereto to seal said slot; and

(c) a second header member having a longitudinal slot into which the other end of the flattened and abutting tubes is inserted and connected thereto to seal said slot.

**4,297,992**

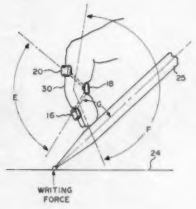
## DISTAL JOINT FINGER SPLINT

**Maureen L. LaRue, 3 Eagle Rock Trail, Ormond Beach, Fla. 32074, and Richard R. Larsen, 1308 Laurel Dr., Daytona Beach, Fla. 32017**

**Filed Nov. 5, 1979, Ser. No. 91,587**

**Int. Cl.³ A61F** *5/10*

**U.S. Cl. 128—77** **4 Claims**




1. A splint for use with an index finger which exhibits hyperextension of a distal joint thereof to permit control of the finger during handwriting, comprising:

a frame having an elongated outer arm with first and second ends, an elongated central arm with first and second ends, and an elongated inner arm with first and second ends, said arms being arranged in parallel relationship with each other, an elongated outer side element having first and second ends, said first end of said outer side element being connected to said first end of said outer arm, said second end of said outer side element being connected to said first end of said central arm, an elongated inner side element having first and second ends, said first end of said inner side element being connected to said first end of said central arm, said second end of said inner side element being connected to said first end of said inner arm, said arms and said side elements forming essentially an E-shape, said frame being otherwise open, said frame being fabricated from a single continuous spring steel wire and having said outer side element and the inner side element bent to form an obtuse angle therebetween;

an outer pad disposed over said outer arm for contacting a dorsal surface of said index finger over the distal phalanx;

a central pad disposed over said central arm for contacting the volar interphalangeal crease of the distal joint of said finger; and

an inner pad disposed over said inner arm for contacting the dorsal surface of said finger over the middle phalanx thereof;

whereby when said splint is disposed on said index finger, said outer pad cooperates with said spring wire side elements to urge said finger into flexion.

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**4,297,993**

## AID FOR OSTEOSYNTHESIS

**Anton Härle, Münster, Fed. Rep. of Germany, assignor to Howmedica International, Inc.-Zweigniederlassung, Kiel, Kiel, Fed. Rep. of Germany**

**Filed Feb. 13, 1979, Ser. No. 11,850**

**Claims priority, application Fed. Rep. of Germany, Feb. 16, 1978, 2806609**

**Int. Cl.³ A61F** *5/04;* **A61B** *17/18*

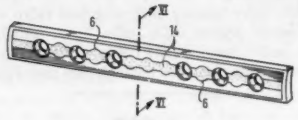
**U.S. Cl. 128—92 D** **9 Claims**

1. An aid removably appliable to a bone at an osteosynthesis site to assist in fusing the bone, said aid comprising:

an elongated, bar like member for bridging the osteosynthesis site, said member being formed of a material having sufficient strength to provide the necessary stabilizing assistance to the bone, said member having perforations for receiving fasteners removably applying the member to

the bone, and said member having at least one indentation in the surface thereof; and

a carrier material fixed in said indentation of said member,



said material being non-absorbable by body tissue and of constant surface form and integrity, said material having an antibiotic substance uniformly distributed therein and released therefrom at a controlled rate.

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**4,297,994**

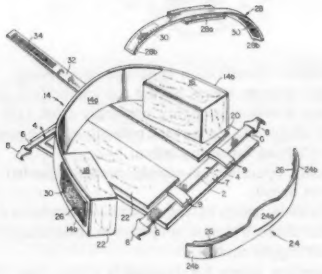
**CERVICAL IMMOBILIZER**

**Robert W. Bashaw, 7008 Creel Dr., Pensacola, Fla. 32506**

**Filed Nov. 27, 1979, Ser. No. 97,879**

**Int. Cl.³ A61F** *13/00*

**U.S. Cl. 128—133** **25 Claims**



**1**. A cervical immobilizer for immobilizing a head of a patient on a support comprising:

a base;

a U-shaped headband having a center portion and two end portions attached to said base at said center portion;

a first and second cushion, said first cushion being attached to one of said end portions and said second cushion being attached to the other;

means for attaching said base to the support;

first cooperating means for fastening said first cushion to said base in varying positions;

second cooperating means for fastening said second cushion to said base in varying positions;

means for holding the chin of the patient in a fixed position; and

third cooperating means for fastening said means for holding to said end portions in varying positions.

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**4,297,995**

**BANDAGE CONTAINING ATTACHMENT POST**

**Allyn L. Golub, Coral Gables, Fla., assignor to Key Pharmaceuticals, Inc., Miami, Fla.**

**Filed Jun. 3, 1980, Ser. No. 156,025**

**Int. Cl.³ A61L** *15/00*

**U.S. Cl. 128—156** **22 Claims**

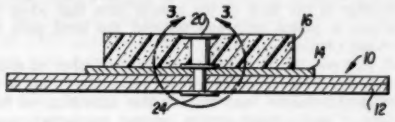
**1**. A bandage comprising:

(a) a lower portion comprising

(1) a first layer having an upper surface;

(2) a base plate having an upper face and a lower face, said lower face being attached to said upper surface of said first layer, said base plate having a surface area less than the surface of said upper surface of said first layer;

(b) a post extending upwardly from the upper face of said base plate; and



(c) a matrix having an upper surface and a lower surface and a hole extending from said lower surface to said upper surface, said lower surface being in intimate contact with the upper face of said base plate, said post passing through said hole.

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**4,297,996**

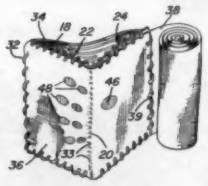
**STERILE BANDAGE AND TOURNIQUET**

**Eduardo C. Uriza, 949 - 3 Del Ejercito, Lima 18, Peru**

**Filed May 7, 1980, Ser. No. 147,375**

**Int. Cl.³ A61F** *13/00*

**U.S. Cl. 128—169** **9 Claims**



**1**. A pressure bandage assembly, said assembly including an elongated absorptive pad including a transverse fold zone centrally intermediate its opposite ends dividing said pad into a pair of opposite end pad sections and along which said pad is folded to place said end pad sections in positions relatively angularly disposed between 40° and 90°, an elongated porous and flexible panel having its opposite ends anchored relative to the remote ends of said end pad sections, said panel being substantially and of a length to extend, in a longitudinally straight condition between said remote ends on the included angle side of said pad when said end pad sections are in said 40° to 90° relatively angulated positions.

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**4,297,997**

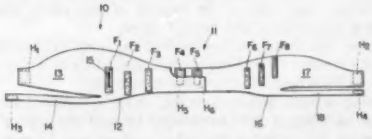
**METHOD AND DEVICE FOR RETAINING COLON CLEANSING TUBE IN PLACE**

**Ralph S. Clayton, Hendrick Professional Center, 1100 N. 19th St., Abilene, Tex. 79601**

**Continuation-in-part of Ser. No. 937,591, Aug. 28, 1978. This application May 16, 1980, Ser. No. 150,424**

**Int. Cl.³ A61F** *13/00*

**U.S. Cl. 128—169** **18 Claims**



**1**. A device for squeezing a person's buttocks together to hold a tube in place in the person's anal opening, comprising:

an elongated band shaped to wrap around a person's midsection including the lower abdomen in the front, the hips on the side and the buttocks in the back,

the central section of the band adapted to fit against the front of the person while the ends of the band are adapted to overlap in the back of the person such that when the device is pulled tight and secured, the band pulls the person's buttocks together,

each said end of the band formed as a plurality of straps, each said strap including a first connecting means at the outer end thereof, said band further including, on both sides of said central section, second connecting means positioned to cooperate with the first connecting means of the end of the strap farthest therefrom to form a connection therewith,

whereby with the band wrapped around the person, generally opposed straps are pulled to tighten the band on the person and then its first connecting means is connected to its corresponding second connecting means to tighten the band and hold the person's buttocks together.

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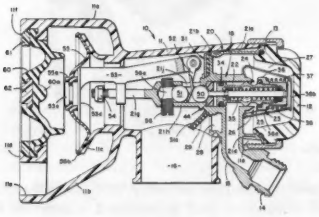
**4,297,998**

## PILOT CONTROLLED REGULATOR SECOND STAGE

**Tony Christianson (a.k.a. Raymond A. Christianson), P.O. Box 3700, Manhattan Beach, Calif. 90266**

**Filed Oct. 12, 1979, Ser. No. 84,421**
**Int. Cl.³ A62B** *7/04*
**U.S. Cl. 128—204.26** **12 Claims**



1. In a scuba regulator second stage of the type having a case having an outlet adapted to be connected to a mouthpiece, an open end and a cap removably covering said open end, and a diaphragm mounted within said case, a removable pneumatic amplification valve module comprising:

a generally cup-shaped valve housing having an open ended outer cylindrical skirt and an open ended inner cylindrical section each extending concentrically in a first direction from a closed end of said valve housing, said valve housing being removably inserted into said case via said case open end and mounted within said case with the open end of said cylindrical skirt being sealably covered by said cap, said valve housing including outlet means for directing gas flow to said case outlet,

the open end of said inner cylindrical section forming a valve seat for a poppet valve,

gas inlet means extending through said casing and communicating with the interior of said inner cylindrical section,

a valve poppet movably mounted within said inner cylindrical section, said poppet having a peripherally mounted valve closure adapted to seat against said valve seat whereby gas flows to the interior of said valve housing upon actuation of said poppet valve,

a poppet bias spring having one end engaging and surrounding a portion of said poppet and extending in a direction away from said valve housing closed end,

a spring retainer attached to said inner cylindrical section and including a portion situated beyond the end of said poppet for retaining the other end of said poppet bias spring,

pilot valve means situated within said poppet and cooperating therewith for actuating said poppet valve said pilot valve means having a control member extending through said valve housing closed end, and

linkage means, mounted on the side of said valve housing closed end opposite from said cylindrical skirt, for linking said pilot valve to the diaphragm of said regulator,

said entire valve module, including said valve housing, gas inlet means, poppet valve, pilot valve, spring, spring retainer and linkage means being removable as a unitary assembly from said case through said case open end.

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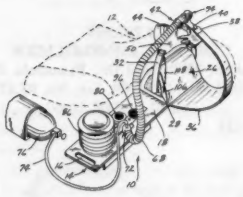
**4,297,999**

## PORTABLE RESUSCITATION APPARATUS

**John V. Kitrell, 1740 Yolande, Lincoln, Nebr. 68521**

**Filed Jul. 19, 1979, Ser. No. 59,079**
**Int. Cl.³ A61M** *16/00*
**U.S. Cl. 128—205.16** **3 Claims**



1. A portable resuscitation apparatus, comprising,

a portable support means having top and bottom portions,

a support member extending upwardly from said support means adapted to support the patient's neck to position the patient's head for resuscitation,

a manually operated air supply means mounted on said support means,

a flexible mask means having an air inlet supply base extending therefrom which is in operative communication with said air supply means,

and connector means for detachably connecting said mask means to the patient's face and to maintain the patient on said support member,

said air supply means comprising a flexible bellows pump mounted on said support means,

said support means having a first air passageway formed therein which is in communication with said pump, said base being in communication with said air passageway whereby compression of said flexible bellows pump will supply air to said mask means,

said bellows pump being movable between compressed and extended positions, a spring means in said bellows pump for yieldably resisting the compression of said bellows pump and for moving said bellows pump from its compressed position to its extended position,

said spring means being of the two-stage type so that said spring means will yieldably resist, at a first predetermined rate, the compression of said bellows pump during a predetermined initial portion of its compression stroke and will yieldably resist, at a rate greater than said first predetermined rate, during a predetermined portion of its compression stroke after said initial portion.

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**4,298,000**

## FLUID DISPENSING DEVICE

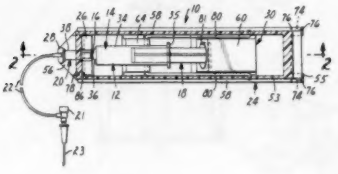
**Gary A. Thill, St. Paul, Minn., and Jerome E. Strand, St. Joseph Township, St. Croix County, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Division of Ser. No. 958,678, Nov. 8, 1978, Pat. No. 4,202,333. This application Apr. 28, 1980, Ser. No. 144,614**
**Int. Cl.³ A61M** *5/00*
**U.S. Cl. 128—218 A** **8 Claims**

1. A dispensing deviee adapted for engaging fluidfilled sy-

ringe to dispense fluid from the syringe at a slow, steady rate, said device comprising a frame adapted for supporting the syringe; a hose adapted to be coupled to an outlet opening of the syringe; and an activating mechanism including a spring coupled to a block movable between a disengaged position out of engagement with the plunger of a syringe supported on the frame to afford insertion or removal of the syringe, and an engaged positon at which the block engages the plunger and the spring applies force to the plunger through the block to cause fluid within said syringe to flow into said hose, wherein the device further includes:

a metering assembly including a first part having two chambers and an orifice communicating between said chambers; a capillary tube extending between said chambers; and a second part mounted on said first part for relative movement between a purging position spaced from said orifice so that fluid can flow between said chambers through said orifice, and a metering position blocking said



orifice so that fluid can pass between said chambers only through said capillary tube;

one of said parts being adapted to be releasably attached to the housing of the syringe with an outlet opening of the syringe communicating with one of said chambers and the hose being attached to the metering assembly with the bore of the hose communicating with the other of said chambers;

said frame comprises support members adapted for engaging and supporting said metering assembly only when the parts of said metering assembly are in their metering position;

said spring is adapted for applying a uniform force to move the block as the plunger moves into the syringe; and

said activating mechanism includes structure adapted to secure the metering assembly in the support members when said activating mechanism positions said block in said engaged position.

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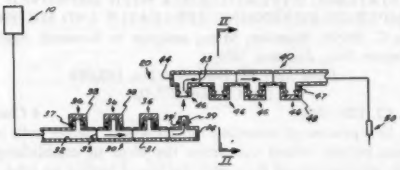
**4,298,001**

## FLUID FLOW CONNECTOR UNIT AND METHOD

**Thomas S. Hargest, III, 1078 Winslow Dr., Charleston, S.C. 29412, and William C. Ryan, Jr., 1583 Sanford Rd., Charleston, S.C. 29407**

**Filed Aug. 8, 1980, Ser. No. 176,287**
**Int. Cl.³ A61M *3/00***
**U.S. Cl. 128—247** **12 Claims**



**1.** A multiple access sterile connector unit comprising a pair of connector elements, each element having a body defining a fluid manifold extending along the length of same, one end of said element being sealed and an opposite end of said element being operably associable with one of a source of fluid and a fluid applicator means, each of said connector elements further having a plurality of spacially separate access ports located therealong and extending outwardly therefrom, said access ports defining a fluid passageway therethrough in communication with said fluid manifold, and each acess port having removable cover means at an outer free end of same in association therewith to maintain said outer free end of said port sterile while said cover means is initially received thereat, said access ports being adapted for operable association with an access port on the other of said connector elements to establish fluid flow through said unit, each of said elements further being adapted for removal of associated access ports when desired and subsequent reassociation of other ports, whereby fluid flow to a patient may be disrupted and reinstituted under sterile conditions.

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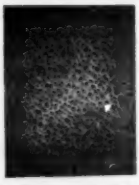
**4,298,002**

## POROUS HYDROPHILIC MATERIALS, CHAMBERS THEREFROM, AND DEVICES COMPRISING SUCH CHAMBERS AND BIOLOGICALLY ACTIVE TISSUE AND METHODS OF PREPARATION

**Samuel H. Ronel, Princeton; Mark J. D'Andrea, Neshanic Station, both of N.J.; William H. Dobelle; Gregory F. Klomp, both of New York, N.Y., and Hiroshi Hashiguchi, Riverdale, N.Y., assignors to National Patent Development Corporation, New York, N.Y.**

**Filed Sep. 10, 1979, Ser. No. 73,680**
**Int. Cl.³ A61M *7/00***
**U.S. Cl. 128—260** **43 Claims**



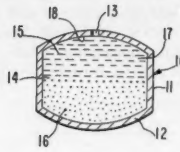
**1.** A synthetic, hydrophilic, polymeric material of a polymer of at least one monomer from the group consisting of a monoalkylene glycol monoester of methacrylic acid, a polyalkylene glycol monester of methacrylic acid, a monoalkylene glycol monoester of crylic acid, a polyalkylene glycol monoester, a N-alkyl substituted acrylamide, a N,N-dialkyl substituted acrylamide, a N-alkyl substituted methacrylamide, a N,N-dialkyl substituted methacrylamide, N-vinylpyrrolidone, an alkyl substituted N-vinylpyrrolidone, and vicinal epoxy alkyl 2-alkenoate, characterized by: water-insolubility; water-swellability; biological inertness; non-toxicity to and compatibility with living tissue; retention of structural integrity over long periods of time in contact with body fluids; a water-uptake capability when in osmotic equilibrium with water of from 5 to 4000 weight percent based on the weight of said hydrophilic material to form a hydrogel; an ultimate strength of about 3 g/mm$^2$ to 200 g/mm$^2$, an initial tear strength of 0.1 g/mm$^2$ to 20 g/mm$^2$, and a progagation tear strength of 0.5 g/mm to 10 g/mm; and 3-dimensional, reticulum-like porosity in which at least about 75 percent of the remaining pores, as determined under a scanning electron microscope, are characterized by an average diameter, not exceeding about 10 microns and in which below about 25 percent of the pores are characterized by an average diameter generally sufficiently small so as to prevent an immune rejection when said hydrophilic material containing biologically active tissue therein is in contact with living tissue environment, the geometry of such permitting the ingress or egress of a steroid.

4,298,003

## SYSTEM FOR DELIVERING AGENT AT ZERO ORDER RATE WITH EMERGING AGENT BELOW SATURATION

Felix Theeuwes, Los Altos, and Richard Cortese, San Jose, both of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Filed May 12, 1980, Ser. No. 149,020
Int. Cl.[3] A61M 7/00
U.S. Cl. 128—260 15 Claims




1. An osmotic system for the controlled delivery of a beneficial agent to an environment of use, comprising:

(a) a wall formed of a semipermeable material permeable to the passage of an exterior fluid, and substantially impermeable to the passage of agents and compounds, the wall surrounding and forming;

(b) a compartment containing a layer of an agent that is soluble in the exterior fluid and exhibits an osmotic pressure gradient across the wall against the fluid, and a layer of a compound that is substantially insoluble in the exterior fluid; and,

(c) a passageway through the wall communicating with the interface defined by the wall's inside surface and the surface of the layer of the insoluble compound.

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4,298,004

## SURGICAL METHOD FOR ALTERING THE CURVATURE OF THE CORNEA OF RABBITS

Ronald A. Schachar, 213 N. Barrett, Denison, Tex. 75020, and Norman S. Levy, 2218 NW. 29th St., Gainesville, Fla. 32605

Filed Feb. 27, 1979, Ser. No. 15,656
Int. Cl.[3] A61F 17/32, 1/16
U.S. Cl. 128—305 11 Claims

1. A method for decreasing the radius of curvature of a cornea comprising:

forming an incision in the cornea that extends over the central portion of the cornea, said incision including a relatively small opening that extends through the surface of the cornea; and

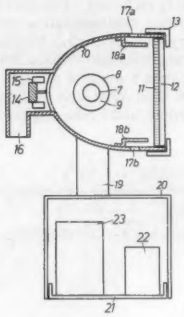
introducing a heated inert, non-antigenic transparent fluid material into said incision to decrease the radius of curvature of the cornea, said inert, non-antigenic transparent fluid material being of the type that is a gel at body temperature after cooling.

4,298,005

## RADIATION APPARATUS

Maxim F. Mutzhas, Pilgersheimerstrasse 64, BRD 8000 Munchen 90, Fed. Rep. of Germany

Continuation of Ser. No. 773,844, Mar. 3, 1977, abandoned. This application Jul. 5, 1979, Ser. No. 55,002
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1976, 2609273
Int. Cl.[3] A61N 5/00; G01J 1/00
U.S. Cl. 128—396 18 Claims




1. In a radiation apparatus for cosmetic, photobiological and/or photochemical purposes comprising,

housing means having an opening therein,

at least one ultraviolet ray source in said housing means and positioned to direct its rays toward and through said opening, said ray source comprising a mercury vapor high pressure lamp containing a metal halogen vapor which lamp produces radiation of substantial intensity in the wavelength range of 320–450 nm,

reflector means formed of a material having a high reflectance for radiation in the wavelength range of 320–450 nm for reflecting the radiation produced by said ray source, said reflector means comprising said housing means and said material comprising polished oxidized aluminum,

filter means for completely suppressing all short wavelength rays passing through said opening having wavelengths below approximately 320 nm, and for suppressing longer visible wavelength rays passing through said opening having wavelengths above approximately 450 nm, and

cooling means for cooling said housing and said source during operation, said cooling means comprising ventilator means for ventilating said housing,

the aforementioned components of said apparatus coacting in combination with each other to result in the production of radiation in the wavelength range of 320–450 nm of at least 150 $W/m^2$.

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4,298,006

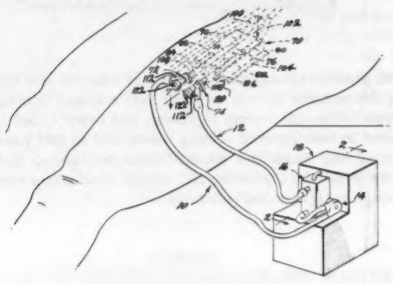
## SYSTEMIC HYPERTHERMIA WITH IMPROVED TEMPERATURE SENSING APPARATUS AND METHOD

Leon C. Parks, Brandon, Miss., assignor to Research Against Cancer, Inc., Jackson, Miss.

Filed Apr. 30, 1980, Ser. No. 145,053
Int. Cl.[3] A61F 7/00
U.S. Cl. 128—399 4 Claims

1. In a process of retarding the growth of cancer cells in a human patient which comprises the steps of establishing a sterile extracorporeal flow path for blood having an inlet, an outlet and a temperature control zone therebetween, establishing communication of the inlet and said extracorporeal flow path with the patient's bloodsream so that blood can be withdrawn and supplied to said extracorporeal flow path without adversely affecting the blood circulation in the areas from which the blood is withdrawn, establishing communication of

the outlet of said extracorporeal flow path with the patient's bloodstream so that blood flowing from the extracorporal flow path is returned to the bloodstream in such a way as to be distributed systemically, pumping blood withdrawn from the patient's bloodstream along said extracorporeal flow path through said temperature control zone at a controlled rate of at least approximately 1 liter per minute and returning the same to the patient's bloodstream to be distributed systemically, as aforesaid, controlling the temperature of the blood flowing along said extracorporeal flow path through said temperature control zone for an initial period during which the temperature control zone for an initial period during which the temperature level of the blood within the zone is raised without causing the same to reach localized temperatures in excess of approxi-



mately 45° C. so that the systemic distribution of the returned blood gradually increases the patient's core body temperature to a generally stable temperature condition at a level of approximately 41.5° C. but not higher than approximately 42.5° C., and maintaining control of the temperature of the blood flowing along said extracorporeal flow path through said temperature control zone at said generally stable temperature for a second time period sufficient to effect the desired treatment; the improvement of which comprises the steps of:

measuring the patient's core body temperature in the patient's bladder and

utilizing the measured bladder temperature in controlling the temperature of the blood flowing along said extracorporeal flow path.

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**4,298,007**

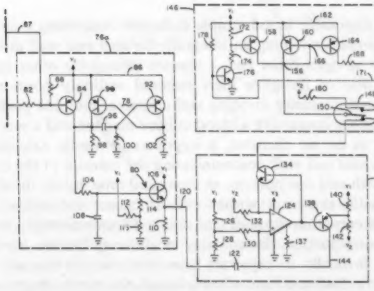
## ATRIAL RATE SENSITIVE CARDIAC PACER CIRCUIT

**Thomas C. Wright, New Brighton; Terrence R. Hudrlik, Minneapolis; Perry A. Mills, Roseville; Robert C. Rust, South St. Paul, and Thomas G. Wallner, St. Paul, all of Minn., assignors to Cardiac Pacemakers, Inc., St. Paul, Minn.**

**Filed Jul. 21, 1980, Ser. No. 170,948**

**Int. Cl.³ A61N *1/36***

**U.S. Cl. 128—419 PG** **12 Claims**



**1.** Cardiac stimulating apparatus having means for adjusting the frequency of stimulation as a function of physiologic demand, comprising in combination:

(a) a pulse generator having timing means therein for determining the frequency at which cardiac stimulating pulses are produced;

(b) detector means for detecting natural atrial electrical activity characteristic of physiologic demand and producing trigger signals predominantly related to P-wave occurrences;

(c) first means coupled to said detector means for producing an electrical signal of predetermined energy content upon receipt of each of said trigger signals;

(d) second means having a first time constant coupled to receive said electrical signals of predetermined energy content for producing a voltage proportional in amplitude to the average repetition rate of said P-wave occurrences during a predetermined time interval;

(e) third means coupled to receive said voltage from said second means and having a second time constant which is relatively long compared to said first time constant for producing a control signal proportional in amplitude to changes in the repetition rate of said P-wave; and

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**4,298,008**

## DEVICE FOR BRASSIERES

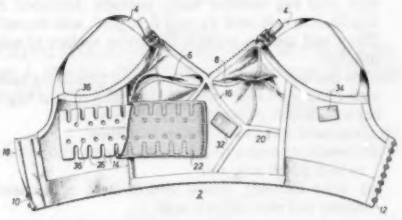
**Nadia M. Kylberg, Angsklockevagen 50, S-181 61 Lidingo, Sweden**

**Filed Nov. 28, 1979, Ser. No. 98,072**

**Claims priority, application Sweden, Jun. 21, 1979, 7905488**

**Int. Cl.³ A41C *1/14***

**U.S. Cl. 128—477** **10 Claims**



**1.** A device for brassieres characterized in that in each half of the brassiere is provided an essentially quadrangular band-shaped member of a flexible, supporting material extending from the area at the centre of the brassiere in the direction towards the back part of the brassiere, said band-shaped member having a thinner portion extending along a longitudinal line so as to be foldable along said line, which partially extends substantially along the lower edge of the cup of said half of the brassiere, so that in use the part of the band-shaped member which is located on one side of said line bears against the lower side of the bust so as to support it with the support from the other part of said band-shaped member, which below the bust bears against the body, transverse slots being formed in both the longitudinal edges of the band-shaped member so that said band-shaped member smoothly adjusts itself to the shape of the bust and the body.

**4,298,009**

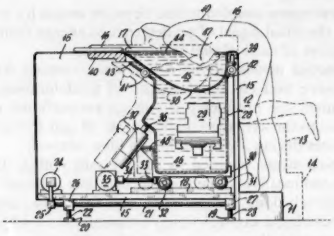
## ULTRASOUND MAMMARY SCANNING APPARATUS

**Reuben S. Mezrich, Miami, Fla.; David H. R. Vilkomerson, Princeton, and Bayard Gardineer, Skillman, both of N.J., assignors to Technicare Corporation, Solon, Ohio**

**Filed Jan. 7, 1980, Ser. No. 109,947**

**Int. Cl.³ A61B *10/00***

**U.S. Cl. 128—660** **6 Claims**



1. A system employing sonic energy to derive select ones of a plurality of substantially parallel sectional images of the human breast of a subject comprising:

(a) a frame member adapted at one extremity to receive the subject having the upper body generally prone, parallel to, and at least partially supported by a top surface of said frame member, said frame member defining a void in said top surface to receive the breast area of the subject;

(b) means associated with said frame member for locating the prone upper body of the subject along a given axis;

(c) a first sonically conductive fluid pool beneath and generally filling said void, said first pool being contained by a flexible, sonically transparent bag member suspended from said top surface, thereby to receive the breast area of the subject in said first pool;

(d) a second sonically conductive fluid pool contained by a rigid tank, beneath said first pool, the open top of said bag member being larger in horizontal section than is said tank, said bag member being partially deformed downwardly into said tank by said first pool, said second pool filling said tank to contact the lower surface of said bag member;

(e) first carriage means for carrying and translating said rigid tank relative to said frame member and to said bag member in a direction parallel to said given axis;

(f) ultrasound transceiver means including

(i) transducer means which oscillates about an axis normal to said given axis, and

(ii) sonic focusing means intermediate said transducer means and said subject; and

(g) second carriage means for carrying and translating said transciever means within said tank in a direction normal to said given axis.

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**4,298,010**

## BREATHING ALCOHOL TESTING DEVICE

**Wolfgang Eckstein, Sereetz, and Horst Rabenecker, Klein Parin, both of Fed. Rep. of Germany, assignors to Drägerwerk Aktiengesellschaft, Fed. Rep. of Germany**

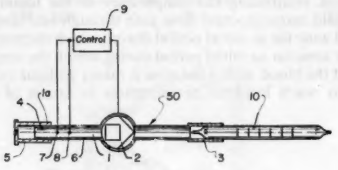
**Filed Oct. 30, 1979, Ser. No. 89,463**

**Claims priority, application Fed. Rep. of Germany, Nov. 8, 1978, 2848337**

**Int. Cl.³ A61B *5/00***

**U.S. Cl. 128—719** **9 Claims**

1. An improved breathing alcohol testing device for determining the alcohol content in the expiratory air of a person, the device being of the type having an elongated detector tube with a bore extending therethrough from an entrance opening to an outlet opening, a gas testing substance mounted within the bore, throughout a length thereof, intermediate the entrance opening and the outlet opening for passage therethrough of the air to be tested, the gas testing substance being of the type which discolors responsive to the alcohol content in the air and wherein the length of the discoloration of the substance is a measure of the alcohol content, wherein the improvement comprises a pump connected to the detector tube for moving the expiratory air to be tested through the detector




tube, pressure sensing means associated with the tube for sensing the pressure therein adjacent said entrance opening upstream of the gas testing substance, and control means connected to said pressure sensing means and to said pump for starting said pump at a predetermined pressure so that said pump forces the expiratory air through the detector tube and through the gas testing substance.

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**4,298,011**

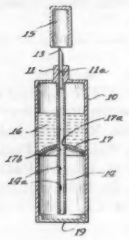
## BLOOD SAMPLE COLLECTOR

**Henry H. Mangurten, 1640 Barry La., Glenview, Ill. 60025, and Chester F. Vanek, 6812 Charlotte, Crystal Lake, Ill. 60014**

**Filed Sep. 7, 1979, Ser. No. 73,232**

**Int. Cl.³ A61B *5/14***

**U.S. Cl. 128—763** **5 Claims**




1. A disposable blood sample collector comprising a cylindrical container having an integrally formed end wall at one end and an open other end, a closure closing the other open end, a disc of frangible inert material sealingly positioned within said container dividing said container into one portion as a chamber containing a blood culture medium and a second portion as an air chamber, a hypodermic needle extending through said end wall communicating the exterior of the container with said one portion, an elongated tube tightly fitted to said needle extension within said container and extending axially therewithin through said disc and communicating with said second portion, the container wall being flexible for deflection inwardly to expel air from said one portion and to return to cylindrical form when released, the needle adapted to engage the blood sample to draw the sample into said air chamber.

4,298,012

## METHOD OF INCREASING THE SPECIFIC VOLUME OF TOBACCO RIBS

Waldemar Wochnowski, Hamburg, Fed. Rep. of Germany, assignor to Hauni-Werke Körber & Co. KG., Hamburg, Fed. Rep. of Germany

Filed Apr. 20, 1978, Ser. No. 898,337

Claims priority, application United Kingdom, Apr. 26, 1977, 17428/77

Int. Cl.[3] A24B *3/18*

U.S. Cl. 131—296 7 Claims

1. A method of increasing the specific volume of tobacco ribs which are separated from tobacco leaf laminae, comprising the steps of conveying a stream of ribs along a predetermined path; agitating the ribs including subjecting the ribs to the action of steam which is conveyed upwardly across said path to cause the ribs of said stream to float in the ascending steam; condensing the steam on the external surfaces of the ribs to thereby wet such external surfaces and to cause release of heat as a result of condensation; effecting penetration of released heat and of condensate into the interior of ribs; maintaining said action for an interval of the time which suffices to cause evaporation of moisture in and resulting expansion of ribs; and rolling, severing and drying the expanded ribs immediately upon completion of said maintaining step.

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4,298,013

## METHOD FOR RECYCLING CELLULOSIC WASTER MATERIALS FROM TOBACCO PRODUCT MANUFACTURE

Bernard A. Semp; Daniel M. Teng, and Gus D. Keritsis, all of Richmond, Va., assignors to Philip Morris, Inc., New York, N.Y.

Filed Apr. 28, 1980, Ser. No. 144,227

Int. Cl.[3] A24B *3/00, 3/12*

U.S. Cl. 131—308 19 Claims

1. A method of recycling cellulosic waste material generated during tobacco manufacturing which comprises:

(a) subjecting the cellulosic waste material to enzymatic saccharification under conditions which promote hydrolysis of cellulose to simple sugars;

(b) recovering the sugar produced in step (a); and

(c) employing the recovered sugar in a tobacco treatment process.

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4,298,014

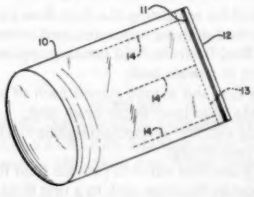
## HAIR PROCESSING SHIELD

Jean MacLennan, 115 Lafayette Rd., Northampton, N.H. 03862

Filed Feb. 13, 1980, Ser. No. 121,050

Int. Cl.[3] A45D *1/00*

U.S. Cl. 132—9 8 Claims




1. A hair processing shield comprising a tube of a flexible plastic film sized to fit over a human head and cover the hair thereon and having at least 2 hand tearable longitudinal lines of perforations therein at one end of said tube, which when two adjacent lines of perforations are torn with one end of the flap therebetween being freed permits said flap to be folded down to form a pocket the sides of which are open.

4,298,015

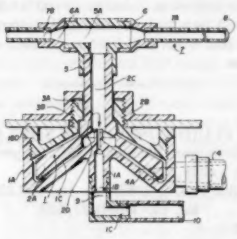
## DISHWASHER

Antonio M. Garza, Jamaica #401, Vista -- Hermosa, Monterrey, N.L., Mexico

Filed Dec. 12, 1979, Ser. No. 102,861

Int. Cl.[3] B08B *3/02*

U.S. Cl. 134—100 6 Claims



1. A hydraulically operated dishwasher comprising in combination, motive means comprising a hydraulic rotatable turbine coupled to a water inlet channel to cause rotation thereof in response to water flow inpact into a turbine member by water passed from a water main into said inlet channel, a water flow path through said turbine, a rotatable spray arm coupled for rotation by the rotatable turbine including a transit channel for passing the water flow from said turbine through spray outlets forcefully in a predetermined direction for washing dishes, and a rack for placing dishes to be cleaned in the spray path of said arm and holding the dishes, such as plates, disposed substantially along said predetermined direction of spray, thereby to be washed by the water flowing through the motive means and the sray arm wherein the turbine has a set of conically disposed blades surrounded by a housing with a conical member extending from said transit channel down an inclined path with the water flow path to the spray arm directed up the inclined path.

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4,298,016

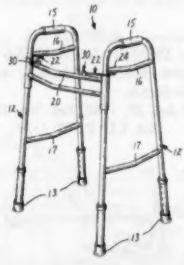
## LOCKING MECHANISM FOR FOLDABLE WALKER

Herbert J. Garelick, Saint Paul, Minn., assignor to Garelick Mfg. Co., Saint Paul Park, Minn.

Filed Jun. 23, 1980, Ser. No. 161,674

Int. Cl.[3] A61H *3/00*

U.S. Cl. 135—67 9 Claims



1. In a foldable walker of the type having a pair of side members each pivotally connected to a front member and having a bridging member extending from each side member to said front member, wherein the improvement comprises a bridge member comprising an elongated rod which is mounted at its first end to said side member and received at its second end through an aperture in a locking member carried on said front member, said elongated rod having a recessed portion

therein near its second end, said locking member comprising a housing having a transverse aperture therethrough, said housing including a mounting stem which is affixed to said front member, wherein a button member having a transverse aperture therethrough is received in said housing and is movable between an outward position and an inward position, wherein bias means normally biases said button member to said outward position, and wherein said button member is adapted to engage said recessed portion of said elongated rod when said recessed portion is moved into said housing and is adapted to release said elongated rod when said button member is moved to its inward position.

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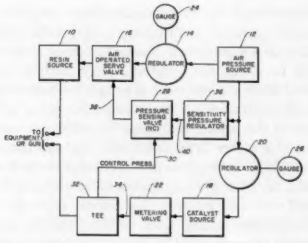
**4,298,017**

## AUTOMATIC FLUID COMPONENT SHUT OFF SYSTEM

**Robert D. Hetherington, Sunland, Calif., assignor to Poly-Glas Systems, Sun Valley, Calif.**

**Filed Feb. 4, 1980, Ser. No. 118,237**
**Int. Cl.[3] G05D *11/035***
**U.S. Cl. 137—1** **16 Claims**




**14**. A method for shutting off the flow of resin in a plural component system when the catalyst pressure falls below a predetermined minimum flow pressure comprising:

connecting a pressure sensing valve in the air supply to a pneumatically operated servo valve controlling the supply of resin;

sensing the flow pressure of said catalyst with said pressure sensing valve;

establishing a pressure control point by metering the flow pressure of catalyst to said pressure sensing valve at which said valve will shut off the flow of air to said servo valve thereby shutting off the flow of resin;

regulating the air flow through said pressure sensing valve to equalize the flow pressure of said catalyst.

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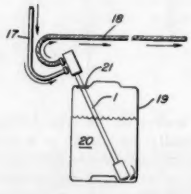
**4,298,018**

## PUMPING PROCESS

**William J. Haggard, Cincinnati, Ohio, assignor to Chemed Corporation, Cincinnati, Ohio**

**Filed Jul. 29, 1980, Ser. No. 173,400**
**Int. Cl.[3] F17D *1/14***
**U.S. Cl. 137—3** **4 Claims**




**1**. The method of pumping a viscous water soluble feed liquid with an eductor pump, said pump having

(a) a venturi element;

(b) an inlet for drive liquid, said inlet feeding to the jet of the venturi element;

(c) an inlet for feed liquid, said inlet feeding to the area beyond the said jet;

(d) an outlet tube fed by the venturi element;

said pump being submerged in said feed liquid; using water as the drive liquid, said method comprising

(1) driving water through the venturi element of the eductor pump on a drive cycle thereby dissolving water soluble liquid in the venturi element and forming a water solution thereof, which solution is driven up the outlet tube and out of the pump;

(2) stopping the drive cycle, whereupon water solution in the outlet tube sinks back down into the feed inlet, where it dilutes the viscous feed liquid in the area of the inlet; thereby initiating a rest cycle;

(3) alternately repeating Steps (1) and (2), the time of the drive cycle in (1) being about 90–95% of the total of drive cycle plus rest cycle.

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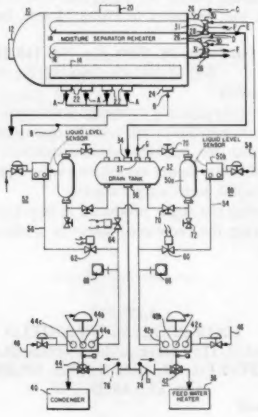
**4,298,019**

## METHOD AND SYSTEM FOR CONTROLLING THE FLUID LEVEL IN A DRAIN TANK

**Thomas E. Daransky, and John D. Dickinson, both of Springfield, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Dec. 27, 1979, Ser. No. 107,799**
**Int. Cl.[3] G05D *7/03, 9/04***
**U.S. Cl. 137—9** **5 Claims**




**5**. A method for regulating the fluid flow rates to two fluid sinks from a fluid utilizing apparatus, said method comprising:

receiving fluid from the fluid utilizing apparatus through an inlet port in a drain tank;

generating first and second signals each of which is indicative of the fluid level in the drain tank;

transmitting said first and second signals to a first and second valve, respectively;

modulating said first valve to provide fluid flow through an outlet port in the drain tank to a first fluid sink and maintain a desired fluid level in said drain tank in response to said signal transmitted thereto when said signal is indicative of a fluid level less than a predetermined height;

modulating said second valve to provide fluid flow to a second fluid sink in response to said signal transmitted thereto when said signal is indicative of a fluid level as least as great as said predetermined height;

monitoring said first and second signals;

obstructing said first signal transmission to said first valve when said first signal is out of a predetermined range;

obstructing said second signal transmission to said second valve when said second signal is out of said predetermined range;

transmitting said second signal to said first valve when said first signal is out of said predetermined range; and

transmitting said first signal to said second valve when said second signal is out of said predetermined range.

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**4,298,020**

## INTEGRATED VALVE DEVICE

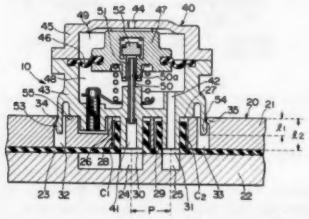
**Masami Inada, Kariya; Kazuhiko Kitamura, Toyota; Shoji Ito, Nagoya; Takao Nonoyama, and Riichi Tsuji, both of Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan**

**Filed Jul. 24, 1979, Ser. No. 60,037**

**Claims priority, application Japan, Jul. 25, 1978, 53-102038[U]**

**Int. Cl.³ F16K *51/00, 31/12***

**U.S. Cl. 137—315** **2 Claims**



**1.** An integrated valve device for fluid control systems comprising base board means formed with at least two openings, and control valve means having at least two ports adapted to communicate with said openings respectively, said base board means having a plurality of channels formed therein, each of said channels being independent of one another for fluid communication with individual ones of said openings, said control valve means including a valve for controlling fluid communication between said channels through said openings, said control valve means being provided at the outer periphery thereof with at least a pair of resilient fingers, said fingers being deformable toward the radial direction thereof and being provided with stepped portions, said base board means having corresponding openings engageable with said fingers, and walls defining the corresponding openings, said walls being formed with shoulders radially spaced from said walls for contacting said stepped portions when said control valve means is mounted on said base board means and wherein said control means includes a flat land adapted to seat on the outer surface of said base board means, said flat level being disposed between one of said openings and said fingers when said control valve means is mounted on said base board means

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**4,298,021**

## WINTERIZING APPARATUS FOR RECREATIONAL VEHICLES, VACATION HOMES AND THE LIKE

**Milton R. Bozeman, 1905 Sixth Ave. North, Great Falls, Mont. 59405**

**Filed Dec. 12, 1979, Ser. No. 102,765**

**Int. Cl.³ E03C *1/02***

**U.S. Cl. 137—334** **3 Claims**

**1.** Apparatus for winterizing recreational vehicles, vacation homes and the like comprising:

a first conduit interconnecting a water supply with a water heater,

pump means connected in said first conduit for pumping water through said first conduit from said supply toward said heater,

a first solenoid valve connected to said first conduit between the water supply and said pump means,

a second conduit connected to said first conduit downstream of said pump means for forming a cold water source,

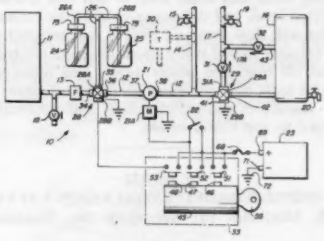
a third conduit connected to said first conduit downstream of said second conduit,

a first check valve connected to said third conduit for passing water only downstream of said second conduit,

a fourth conduit interconnecting said heater to said third conduit downstream of said first check valve,

a second check valve in said fourth conduit for passing water only from said heater to said fourth conduit,

a second solenoid valve connected to said first conduit between said third conduit and said heater,



a fifth conduit connected to said first solenoid valve,

a source of anti-freeze connected to flow into said fifth conduit, and

switch means for selectively electrically energizing said pump means and said first and second solenoid valves to selectively open said second, third and fourth conduits to water from said supply or to close said second conduit to water from said supply and said heater from connection to said second conduit and to connect said first conduit through said first solenoid valve and at least a part of said second conduit to said third and fourth conduits,

said switch means comprising a key operated rotary drum having a plurality of cams mounted on its outer periphery for sequentially operating said pump means and said first and second solenoids.

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**4,298,022**

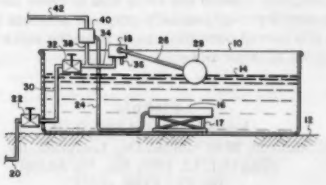
## ENERGY SAVER CONTROL FOR OUTDOOR WATER HEATER

**William R. Walters, 910 W. Caddo, Cleveland, Okla. 74020**

**Filed Mar. 10, 1980, Ser. No. 128,466**

**Int. Cl.³ A01K *7/04***

**U.S. Cl. 137—341** **3 Claims**



**1.** In an outdoor water heater system, comprising;

(a) an open tank, a pressurized source of water to fill said tank to a selected level, and a conventional type water level control means to maintain said selected level;

(b) a source of electrical power and electric heater means for

applying heat to the water in said tank to keep said water from freezing;

the improvement in energy saving means to control said electric heater means, comprising;

(c) water flow rate control means inserted between said water source and said water level control means, for reducing the rate of flow of water into said tank to a selected value when said water level control means is open;

(d) water pressure controlled electrical switch means connected in the water line between said water flow rate control means and said water level control means; said switch means adapted to apply electrical power to said heater means when the water pressure on said switch from said water line is above a selected first high value, and to cut off said electrical power to said heater means when the water pressure on said switch from said water line is less than a second low value;

whereby when said water level in said tank is less than said selected level, and said water level control means is open, water will flow into said tank at said selected flow rate, the pressure in said water line is low, and electrical power is cut off from said heater means; and when said water level is high, and said water level control means is closed, the pressure on said switch is high, and electrical power is applied to said heater means.

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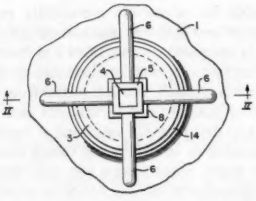
**4,298,023**

## SPRING LOADED EXHALATION VALVE

**Gerald E. McGinnis, 131 Kelvington Dr., Monroeville, Pa. 15146**

**Filed Sep. 9, 1980, Ser. No. 185,532**
**Int. Cl.³ F16K *15/06***
**U.S. Cl. 137—529** **6 Claims**



1. An exhalation valve for inhalation therapy, comprising a base member provided with an exhalation port encircled by a valve seat, a valve closure disc for said port, a pin connected to the center of said disc and extending outwardly away from the side of the disc remote from the port, a sleeve spaced from said disc and slidably receiving said pin, a support connecting the sleeve to said base member, at least two constant-force compression coil springs extending between said sleeve and disc, and means on said sleeve and disc for connecting the ends of the springs thereto, said springs being bowed outwardly away from said pin when said disc is seated on said valve seat and urging said disc toward the valve seat to close the valve, the springs exerting a substantially constant pressure against the disc as it is moved outwardly away from the valve seat by air flowing out through said port.

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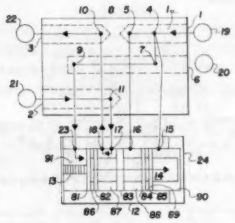
**4,298,024**

## VALVE TIMER DEVICES

**Jesse C. McLeod, 9930 Melissa Dr., Louisville, Ky. 40223**

**Filed Oct. 12, 1979, Ser. No. 84,088**
**Int. Cl.³ F16K *31/12***
**U.S. Cl. 137—624.11** **4 Claims**

1. A pneumatic actuator and timing means to provide a selectively timed output control signal including base means having a first port communicating with a supply of pressurized fluid, first orifice means communicating with said first port, second orifice means communicating with said first port means, third orifice means communicating with said first orifice means, reservoir means consisting of at least two chambers connected by a passageway communicating with said third orifice means, fourth orifice means communicating with said reservoir means, signal output port means, fifth orifice means communicating with said signal output port means, bleed port means, sixth orifice means communicating with said bleed port means; further including valve means where said valve means includes a valve body defining a valve chamber adapted to receive a valve member longitudinally movable therein with bias means to urge said valve member from a second position within said valve chamber to a first position within said valve chamber and where said valve member includes first vane means defining a first chamber between said first vane means and one end of said valve body, second vane means in spaced relation from said first vane means defining second chamber within said valve body between said first and second vane means, third vane means located in spaced relation from second vane means to define a third chamber within said valve body between said second and third vane means, and a fourth



chamber within the valve body between said third vane means and a second end wall of said valve body where said valve body further includes first valve orifice means communicating with said first orifice means and said fourth chamber, second valve orifice means communicating with said second orifice means and said third chamber, third valve orifice means communicating with said fifth orifice means and said second chamber when said valve member is in said first position and with said third chamber when said valve member is in second position, fourth valve orifice means communicating with said sixth orifice means and said second chamber, fifth valve orifice means communicating with said fourth orifice means and said first chamber whereby said valve member is moved from said first position to said second position by selected pressure in said fourth chamber and where said fluid flows from said first port to said fourth chamber to move said valve member to said second position where said fluid flows to said signal output port and said first chamber until a selected pressure is achieved in said first chamber where said valve member returns to said first position to terminate said fluid flow to said signal output port.

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**4,298,025**

## CONTROL VALVE FOR WATER SOFTENERS

**William C. Prior, Newbury, and Keith E. Brown, Solon, both of Ohio, assignors to Kinetico, Inc., Newbury, Ohio**

**Filed May 5, 1980, Ser. No. 146,218**
**Int. Cl.³ B01J *47/14***
**U.S. Cl. 137—624.14** **10 Claims**

5. In a water softener control device including a housing enclosing a water usage monitoring means and a regeneration control means, the improvement comprising:

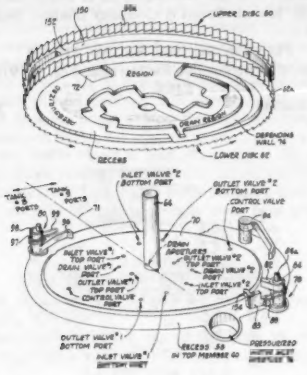
(a) a water turbine rotatably mounted within said control device in a path of discharged softened water;

(b) a water usage disc including perimetrically disposed ratchet teeth mounted for rotative movement in said housing, movement in said disc being in proportion to the

amount of softened water discharge from the control device;

(c) a regeneration control disc mounted for rotation, coaxial with said water usage disc, said control disc controlling the sequence of water softener regeneration;

(d) a regeneration control turbine disposed within said housing in a path of metered fluid flow;


UPPER DISC 60
LOWER DISC 62
RECESS
DEPENDING WALL 76
INLET VALVE "2" BOTTOM PORT
OUTLET VALVE "2" BOTTOM PORT
CONTROL VALVE PORT
DRAIN APERTURES
OUTLET VALVE "2" TOP PORT
DRAIN VALVE "2" PORT
INLET VALVE "2" TOP PORT
OUTLET VALVE "1" BOTTOM PORT
INLET VALVE "1" BOTTOM INLET
RECESS 58 IN TOP MEMBER 60
PRESSURIZED WATER INLET INTERFACE 74

(e) a first indexing means operatively driven by said water usage turbine, said first indexing means being engageable with said ratchet teeth of the water usage disc and operative to incrementally rotate said disc after a predetermined number of turbine revolutions;

(f) a second indexing means driven by said regeneration control turbine and operative to incrementally rotate said control disc upon a predetermined number of revolutions of said regeneration turbine.

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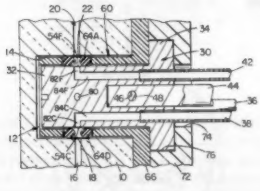
**4,298,026**

## SPOOL VALVE

**Paul J. Ambers, Westwood, Mass., assignor to Instrumentation Laboratory Inc., Lexington, Mass.**

**Filed Dec. 17, 1979, Ser. No. 104,296**
**Int. Cl.³ F16K *5/04***
**U.S. Cl. 137—625.47** **10 Claims**



1. A valve comprising a housing member that has a recess, a body member disposed in said recess, said housing and body members including coaxial cylindrical valve surfaces in juxtaposed spaced relation, an array of at least three resilient support elements circumferentially spaced about said valve body between said juxtaposed spaced valve surfaces for centering said valve body in said housing recess, positioning means in said annular space between said housing and body valve surfaces fixing said resilient support elements in predetermined circumferential and axial positions between said two valve surfaces, a plurality of passages in said housing member, each said housing passage terminating in a port in said housing valve surface, a plurality of ports in said valve surface of said valve body arranged for selective alignment with said housing ports as said valve body member is rotated relative to said valve housing member, a plurality of separate passages in said valve body including a through passage connecting two of said valve body ports and a second passage separate from said through passage connecting a third of said valve body ports to a fourth port in said valve body, at least two of the resilient support elements being apertured and said positioning means locating said apertured support elements in alignment with ports on one of the juxtaposed members such that each said apertured support element conforms in sealing engagement between said juxtaposed cylindrical valve surfaces and functions as an annular valve seal member, said valve body being mounted for movement within said housing member between a first position in which said through passage connects first and second passages in said housing member and a second position in which said second body passage connects one of said ports in said housing member to said fourth port in said valve body member.

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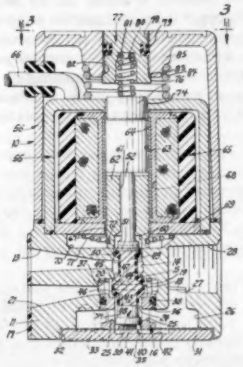
**4,298,027**

## THREE-WAY NORMALLY CLOSED PILOT VALVE

**James A. Neff, Bloomfield Township, Oakland County, Mich., assignor to Mac Valves, Inc., Wixom, Mich.**

**Filed Feb. 22, 1979, Ser. No. 14,245**
**Int. Cl.³ F15B *13/044***
**U.S. Cl. 137—625.65** **2 Claims**



1. A three-way, normally closed only, pilot air valve including a valve body with a pressurized pilot air inlet port, a cylinder port, and an exhaust port, characterized in that:

(a) said valve body has a bore formed therethrough;

(b) a tubular valve retainer member, having an axial bore formed therethrough, is operatively mounted in one end of said valve body bore in a position between the cylinder port and the exhaust port, and it has a tubular side wall and an inner end and an outer end;

(c) a first passageway means is formed through the valve body and it interconnects said pressurized pilot air inlet port to the valve body bore at the other end thereof;

(d) a second passageway means if formed through the valve body and it extends laterally through the tubular side wall of the valve retainer member, adjacent the inner end thereof, and it interconnects said cylinder port with the axial bore in the valve retainer member;

(e) a third passageway means is formed through the valve body, and it extends laterally through the tubular side wall of the valve retainer member, adjacent the outer end thereof, and it interconnects said exhaust port with the axial bore in the valve retainer member;

(f) a first circular sharp edged poppet valve seat is formed in the valve body bore between the first passageway means and the second passageway means, and a second circular sharp edged poppet valve seat is formed in the axial bore

of the valve retainer member between the second passageway means and the third passageway means;

(g) a poppet spool valve is movably mounted in said valve body between a normally closed inoperative position and an open operative position, with a first portion thereof being slidably mounted in said valve body bore, and a second portion thereof being slidably mounted in the axial bore in the valve retainer member;

(h) said poppet spool valve is provided with a first conical annular valve member and a longitudinally spaced apart second conical annular valve member for sealing engagement with the first and second circular sharp edged poppet valve seats, respectively, so that when the poppet spool valve is in the inoperative position the first conical annular valve member is seated on the first circular sharp edged poppet valve seat and the poppet spool valve blocks the first passageway means from communication with the second passageway means through the valve body bore and the axial bore in the valve retainer while simultaneously the second conical annular valve member is unseated to open communication between the second and third passageway means through the valve body bore and the axial bore in the valve retainer member, to allow the air under pressure entering said cylinder port to be exhausted out said exhaust port, and when the poppet valve spool is in the operative position the second conical annular valve member is seated on the second circular sharp edged poppet valve seat and the poppet spool valve blocks the communication between the second and third passageway means and the first conical annular valve member is unseated to open communication between the first and second passageway means to allow pressurized pilot air to flow from the pilot air inlet port to the cylinder port;

(i) a solenoid operatively engaged with one end of said poppet spool valve for moving the poppet spool valve from an inoperative position to an operative position;

(j) the poppet spool valve is normally biased to the inoperative position by means which includes a return spring means engaged with the other end of the poppet spool valve;

(k) said poppet spool valve is provided at said other end with an enlarged diameter end which is mounted in the axial bore in the valve retainer with a close clearance and engaged on its outer end by said return spring means, and the third passageway means extends through the tubular side wall of the valve retainer member to communicate with the axial bore in the retainer member at a point between said enlarged diameter end and said second conical annular valve member, so that a substantially balanced condition is present between said enlarged diameter end of the poppet spool valve and the lower side of the second conical annular valve member during an exhausting flow of air under pressure from the second passageway means to the third passageway means;

(l) said means for normally biasing the poppet spool valve to the inoperative position also includes a fourth air passageway means in the valve that communicates the outer end of the axial bore in the retainer member, at a point outward of said poppet valve enlarged diameter end, with the third passageway means to allow air exhausting from the cylinder port to the exhaust port to leak past said enlarged diameter valve end and fourth passageway means to engage said other end of the poppet spool valve for assisting the return spring means in moving the poppet spool valve from the operative position to the inoperative position;

(m) said poppet spool valve is provided with only one dynamic seal; and,

(n) said first and second conical annular valve members are longitudinally spaced apart on the poppet spool valve and are disposed with their valve seat engaging faces converging toward each other, in a direction radially outward from the longitudinal axis of the poppet spool valve, so that the first and second conical annular valve members are angularly disposed when they engage their respective valve seats.

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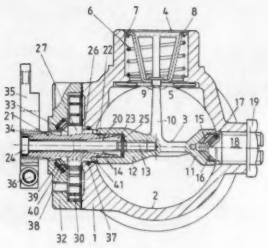
**4,298,028**

## STARTING VALVE AND MOUNTING THEREFOR

**Reinhard Fried, Nussbaumen; Andreas Mayer, Niederrohrdorf, and Ambrogio Perego, Wettingen, all of Switzerland, assignors to BBC Brown, Boveri & Company Limited, Baden, Switzerland**

**Filed Jan. 24, 1980, Ser. No. 115,131**
**Claims priority, application Switzerland, Feb. 1, 1979, 964/79**
**Int. Cl.³ F16K** *11/14, 1/22*
**U.S. Cl. 137—868** **22 Claims**



**1**. A mounting for a valve comprising:

a valve pivotable within a housing about an axis from a closed position to an open position;

first and second enlarged sections on the valve at first and second ends of the axis respectively;

the first enlarged section containing first resilient bearing means for allowing the valve to pivot and means for adjustably securing the first resilient bearing means; and

the second enlarged section containing means for non-rotatably mounting a valve shaft.

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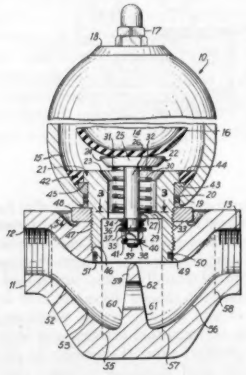
**4,298,029**

## PRESSURE PULSE DAMPENER DEVICE

**Abduz Zahid, Los Angeles, Calif., assignor to Greer Hydraulics, Incorporated, Chatsworth, Calif.**

**Filed Sep. 24, 1979, Ser. No. 78,014**
**Int. Cl.³ F16L** *55/04*
**U.S. Cl. 138—30** **4 Claims**



**1**. A pulse dampener device for hydraulic systems comprising a pressure vessel, a resilient, distensible bladder member disposed in said vessel and dividing said vessel into two discrete chambers, a gas charging port in communication with

one said chamber, an oil port in communication with the other said chamber, a mounting fixture supporting said pressure vessel, said fixture including a conduit extending generally transversely to the axis of said vessel and including input and output fittings, said fixture including a passage extending downwardly from said oil port to said conduit in a direction generally axially of said vessel and having a downwardly directed entrance, a baffle member disposed in said conduit in transversely blocking position thereof, said baffle including a by-pass aperture directed substantially axially of said conduit, the cross sectional area of said aperture being less than the cross-sectional area of said conduit at said fittings, the upper end portion of said baffle being essentially coterminous with said entrance of said passage, said conduit progressively increasing in cross-sectional area in the direction from said fittings toward said baffle, the cross-sectional area of said conduit adjacent said baffle being at least about twice the cross-sectional area of said conduit at said input and output fittings, said conduit from said fittings to said baffle being inclined throughout in a downward direction generally away from said oil port.

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**4,298,030**

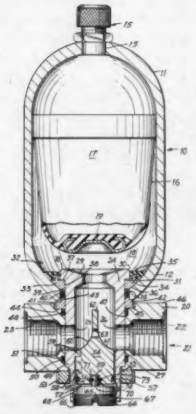
## ADJUSTABLE PULSE DAMPENER

**Jacques H. Mercier, Paris, France, assignor to Normand Trust, New York, N.Y.**

**Continuation-in-part of Ser. No. 66,817, May 15, 1979. This application Mar. 31, 1980, Ser. No. 135,332**

**Int. Cl.³ F16L** *55/00*

**U.S. Cl. 138—30** **7 Claims**



**1.** An adjustable pulse dampener device comprising, in combination, a pressure vessel having a gas charging port at one end and an oil port in the other end, a housing mounted on said other end of said vessel and including walls forming a through-going flow passage, fitting means at the terminal ends of said passage for connection to a conduit of a hydraulic circuit, a gas charging valve mounted in said gas port, a resilient expansible partition mounted in said vessel and dividing the same into two chambers in communication, respectively, with said oil port and said gas port, a hollow cylindrical sleeve member mounted in said housing and extending axially into said pressure vessel through said oil port, the upper end of said sleeve member defining a valve seat positioned to coact with said partition to open and close said oil port in accordance with the pressures within said chambers, said sleeve including a spaced pair of apertures extending transversely therethrough, said apertures being in coaxial alignment with each other and with said flow path, a baffle member mounted in said sleeve, said baffle member including portions disposed in said flow passage between said apertures in partial blocking relation of said path, and adjustment means interposed between said sleeve and said baffle member for shifting said baffle member axially of said sleeve into variable blocking positions of said flow path.

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**4,298,031**

## SHED FORMING DEVICE FOR LOOMS

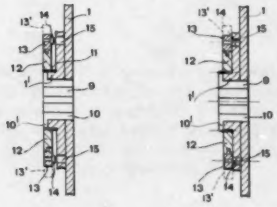
**Graziano Genini, Stabio, Switzerland, assignor to Albatex AG, Vaduz, Liechtenstein**

**Filed Aug. 9, 1979, Ser. No. 65,155**

**Claims priority, application Switzerland, Aug. 14, 1978, 8599/78**

**Int. Cl.³ D03C** *1/12*

**U.S. Cl. 139—55.1** **7 Claims**



**1.** In a device for carrying out shed formation in looms, of the type having members operated by a common rotating drive shaft and linkages controlled by said members to move heald frames, and a clutch interposed between said drive shaft and each of said members selectively to release said member from rotation with the drive shaft; the improvement in which said clutch comprises a sleeve fast for rotation with the drive shaft, said member being mounted for rotation on said sleeve, said sleeve having a radially outwardly projecting end flange having at its outer periphery a splined profile, said member having an axially extending flange coaxial with and of the same outer diameter as said sleeve flange, said member flange having an identical splined profile on its outer periphery as said sleeve flange, a clutch ring having on its inner periphery a splined profile adapted to mate with and slide axially on said splined profiles of said flanges, and a drive ring mounted axially slidably but non-rotatably on said clutch ring for moving said clutch ring axially between a first position in which said clutch ring bridges over and interconnects said sleeve flange and said member flange for conjoint rotation with said drive shaft, and a second position in which said splined inner periphery of said clutch ring mates only with said splined outer periphery of said member flange thereby to permit rotation of said sleeve within and relative to said member, said drive ring in said second position of said clutch ring engaging said member to prevent rotation of said member.

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**4,298,032**

## SHUTTLE GRIP

**Frank H. Kaufmann, and Charles F. Kramer, both of Greenville, S.C., assignors to Steel Heddle Manufacturing Co., Greenville, S.C.**

**Filed Sep. 7, 1978, Ser. No. 940,374**

**Int. Cl.³ D03J** *5/16*

**U.S. Cl. 139—207** **4 Claims**

**1.** An encapsulated shuttle grip for use in a shuttle for holding a bobbin in a properly aligned position during weaving, positioning rings carried on a butt end of said bobbin, said shuttle grip comprising:

a pair of opposed rigid steel leaves having:

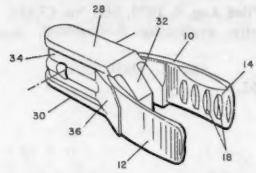
(i) outer spaced apart steel gripping jaws for receiving a butt end of a bobbin,

(ii) inner shank portions, and

(iii) grooves provided on inner surfaces of said steel gripping jaws for receiving said rings of said bobbin,

a molded housing,

said inner shank portions being imbedded in said molded housing with said gripping jaw portions extending outwardly from said housing in a spaced apart relationship for receiving a bobbin head, said inner surfaces of said steel gripping jaws being free of said molded housing, and




said molded housing extending on both sides of each leaf a sufficient distance toward said outer spaced apart steel jaws for positively and firmly holding said outer ends of said leaves in precise spaced apart relation maintaining the alignment of said leaves relative to each other as preset during molding said housing on said leaves.

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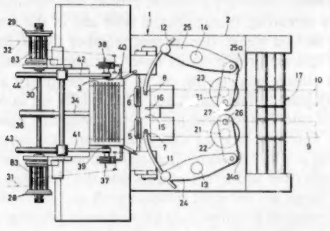
**4,298,033**

## WEFT TENSIONING DEVICE

**Kihei Takahashi; Seiko Terada, both of Uozu, and Kiyoshi Nakada, Nyuzen, all of Japan, assignors to Yoshida Kogyo, K.K., Japan**

**Filed Jul. 17, 1979, Ser. No. 58,209**
**Claims priority, application Japan, Jul. 18, 1978, 53-87978**
**Int. Cl.³ D03D *47/34***
**U.S. Cl. 139—450** **8 Claims**



1. In a loom having a reciprocable filling carrier, a weft tensioning device comprising:

(a) a weft yarn feeder rotatable in synchronism with the reciprocation of the filling carrier for supplying a weft yarn to the filling carrier, said weft yarn feeder including weft winding means having a variable diameter for advancing the weft yarn at different rates at the same speed of rotation of the weft yarn feeder; and

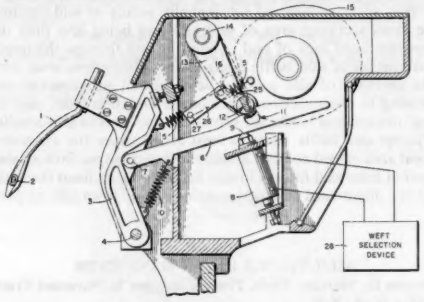
(b) a tension compensator disposed between said weft yarn feeder and the filling carrier, said tension compensator including a pair of weft guides for carrying the weft yarn along a substantially straight path therebetween and stack takeup means disposed between said pair of weft guides and actuatable in synchronism with the operation of said weft yarn feeder for intermittently shifting sideways the weft yarn off said path, said slack takeup means comprising a pair of eccentric plate cams corotable in planes substantially perpendicular to said path in response to the rotation of said weft yarn feeder, said cams having portions movable across and retractable from said path in response to the rotation of said cams, and a yarn guide fixedly disposed between said cams for carrying the weft yarn in said path.

**4,298,034**

## WEFT PRESENTING DEVICE FOR WEAVING LOOMS

**Ettore Viscardi, Nembro, Italy, assignor to Somet Societa Meccanica Tessile S.p.A., Gazzaniga, Italy**

**Filed Jan. 31, 1980, Ser. No. 117,297**
**Claims priority, application Italy, Feb. 9, 1979, 20077 A/79**
**Int. Cl.³ D03D *47/38***
**U.S. Cl. 139—453** **3 Claims**




1. A device for presenting the weft in weaving looms, comprising a plurality of oscillating presenting rods having their free end in the form of an eyelet for the weft thread, a corresponding plurality of control levers for said rods, magnet means for causing the oscillation of said control levers and a transversal bar for the operaton thereof; engaging an approximate seat of those control levers being oscillated by said magnet means, characterized in that, the transversal operating bar has a flattened section with mixed-line contour, adapted to freely insert itself into the seat of the control levers of the device, said seat having a corresponding mixed-line contour section, and to respectively cooperate with said seat, depending on the reciprocal position between the transversal bar and the seats of the levers, and in that, said bar is fixed to an end of at least one guide lever which controls the position thereof during its movements and which is pivoted, at its outer end, to a connecting rod oscillating about a fixed point.

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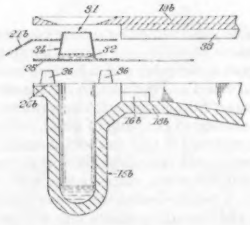
**4,298,035**

## METHOD FOR MEASURING AND DISPENSING FRACTIONARY VOLUMES OF LIQUID SAMPLES

**Miles G. Hossom, Hauppauge, N.Y., assignor to American Home Products Corporation, New York, N.Y.**

**Filed Oct. 11, 1979, Ser. No. 84,029**
**Int. Cl.³ B65B *3/04***
**U.S. Cl. 141—1** **6 Claims**



5. In a method for the identification of bacteria in a liquid sample by subjecting the liquid sample to a plurality of different test media comprising the steps of: providing a rotable casing defining an upwardly open central chamber concentric with the rotational axis of said casing, a plurality of radial pockets communicating at the inner ends thereof with said central chamber for gravity flow of liquid from said chamber into each of said pockets, the outer ends of said pockets communicating by means of a flow restriction with each of the

plurality of vented test cells formed in the rotatable casing, some at least of said cells containing a bacteria growing medium and growth indicator in lyophylised or other dried form,

filling said central chamber with said liquid sample until the pockets are filled up to said constrictions by gravity flow from said chamber,

inserting said closure means to isolate said predetermined volumes of liquid in said pockets,

rotating said casing about said axis to create centrifugal forces sufficient to overcome said capillary forces and to cause transfer of said volumes from said pockets into said test tubes,

incubating said bacteria for the predetermined time period, and optically determining the chemical change produced by the bacteria in each said cell,

the improvement which comprises facilitating a controlled flow of the liquid sample from the central chamber to said pockets by including in said liquid sample from about 0.3 to about 3.0% weight by volume of polyvinylpyrrolidone having an average molecular weight greater than about 40,000 and less than about 400,000.

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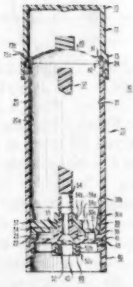
**4,298,036**

## DISPENSER FOR STICK SOLIDS

**William Horvath, Watchung, N.J., assignor to Plastic Research Products, Inc., Warren, N.J.**

**Filed Dec. 13, 1979, Ser. No. 103,049**
**Int. Cl.³ B65H *3/04, 7/28***
**U.S. Cl. 141—1** **19 Claims**



1. A device constructed to enclose and dispense solid or semi-solid stick product, comprising in combination:

a hollow cylindrical container having walls of substantially uniform diameter wherein the angle between the inner wall of said container and the principal axis of said container does not exceed about 0.2°, an open upper end for the dispensing of said product, and the base end of which is at least partially closed;

a slidable non-rotatable cup-shaped plunger mounted in the base end of said cylindrical container substantially concentric with the axis of said container and having an annular, upwardly projecting peripheral flange, said flange constructed and arranged to move in sealed slidable relation to the inner wall of said container and to form a vaportight seal against said wall for containing said product;

a removable cap attached to, and sealing against the upper end of said container above said product;

means for filling said container and said cup-shaped plunger with a molten or semi-molten product which assumes a solid or semi-solid form;

means cooperating with said plunger for progressively propelling said solid or semi-solid product axially toward said open upper end, wherein said projecting means comprises a mechanism for the upward vertical displacement of said plunger within said container.

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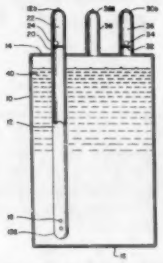
**4,298,037**

## METHOD OF SHIPPING AND USING SEMICONDUCTOR LIQUID SOURCE MATERIALS

**John C. Schumacher, and Andre Lagendijk, both of Oceanside, Calif., assignors to J. C. Schumacher Co., Oceanside, Calif.**

**Continuation of Ser. No. 940,470, Sep. 8, 1978, abandoned, which is a division of Ser. No. 746,923, Dec. 2, 1976, abandoned. This application Feb. 22, 1980, Ser. No. 123,563**
**Int. Cl.³ B65B *3/00*; B65D *25/08***
**U.S. Cl. 141—1** **8 Claims**



1. A method of packaging liquid for shipment which permits said liquid after receipt by a user, to be used in a manner which avoids exposure of said liquid to the atmosphere comprising:

positioning said liquid in a bubbler container having an inlet tube connected thereto which extends into the interior of the container and terminates near the bottom of the container, said tube having an opening in its lower end so that gas may be applied to the upper end of the tube and be allowed to escape out of the lower end of the tube and bubble through the liquid, said container further having an outlet tube connected to the upper end of the container;

forming an inner, easily breakable seal across each of said tubes which prevents leakage of said material; and

forming a second seal across each of said tubes spaced outwardly from said first seal, said outer seals meeting safety shipping regulations including providing a positive seal that prevents leakage and can withstand an internal pressure of 15 PSI gauge, to permit said double sealed container to be shipped to a user so that after the shipment reaches said user, the outer seals can be manually broken without breaking said inner seals, connections made to the tubes, the area of said tubes above said inner seals purged of atmosphere and said inner seals independently broken by suitable means not requiring access to the interior of the tubes.

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**4,298,038**

## TECHNIQUE AND DEVICE FOR MEASURING FLUIDS INCLUDING FINGER VALVE AND FILLER MECHANISM

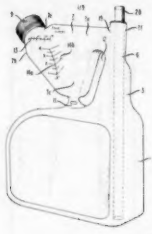
**J. Thomas Jennings, 5 Hickory Rd., Short Hills, N.J. 07078**

**Filed Sep. 21, 1979, Ser. No. 77,642**
**Int. Cl.³ G01F *11/26***
**U.S. Cl. 141—2** **13 Claims**

1. In a device for measuring fluids dispensed from a primary container having an upwardly opening mouth for pouring out fluid when said container is rotated from its reference position in a vertical plane at least through its starting pour angle, the principal axis of said primary container being substantially vertical when said container is disposed in its reference position, said device comprising in combination a measuring vessel constructed to be secured adjacent to the mouth of said primary container for measuring and dispensing a measured amount of fluid poured out from said primary container, said measuring vessel having a cross-sectional shape in said vertical plane comprising an enlarged top portion and a constricted

base portion at the lower end of said measuring vessel adjacent the mouth of said primary container;

means connected to said mouth for providing a modified pour-spout for said primary container to increase the starting pour angle thereof, said means comprising a connecting tube connected in fluid-tight relation between said mouth at its lower end and the upper portion of said measuring vessel, said tube being externally spaced-apart from a lateral wall of said measuring vessel to form a handle;



said measuring vessel closed at the top except for a first opening directed to the atmosphere adjacent the top end of said connecting tube, said first opening including a removable valve;

and a second opening directed to the atmosphere which is closeable by a conventional cap, comprising a dispensing spout of said measuring vessel disposed on the opposite side of the principal axis of said primary container from said first opening.

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**4,298,039**

## REVOLVING CONTAINER PROCESSING PLANT

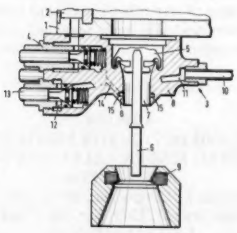
**Uwe Knabe, Dortmund; Siegmar Sindermann, Kamen-Heeren, and Heinrich Jordan, Dortmund, all of Fed. Rep. of Germany, assignors to Holstein and Kappert GmbH, Dortmund, Fed. Rep. of Germany**

**Filed Oct. 9, 1979, Ser. No. 82,625**

**Claims priority, application Fed. Rep. of Germany, Oct. 20, 1978, 2845646**

**Int. Cl.**[3] **B65B** *3/04;* **B67C** *7/00;* **B08B** *3/02*

**U.S. Cl. 141—90** **13 Claims**



2. A revolving container processing plant comprising a tank for holding liquid to be filled into containers, said tank being mounted for rotational movement and having a vacuum channel communicating therewith, a plurality of filling valves arranged on said tank for filling containers with said liquid and at least one liquid feeder passageway for communicating said liquid from said tank to said filling valves, each of said filling valves including a valve body having a liquid outlet opening for passing said liquid into the containers and at least one spray passageway in said valve body for directing a liquid spray from inside said valve body into said liquid outlet opening so that the liquid spray contacts at least liquid carrying parts of said filling valve to remove container fragments therefrom, and an interconnecting valve coupled between said vacuum channel and said spray passageway for transmitting liquid in said channel to said spray passageway in response to breakage of a container wherein said vacuum channel operates to accumulate liquid to be supplied to said spray passageway.

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**4,298,040**

## FILL DEVICE

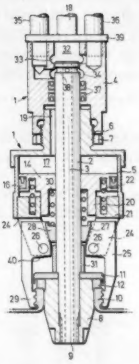
**Kurt Pohan, Freigericht, Fed. Rep. of Germany, assignor to Leybold-Heraeus GmbH, Cologne, Fed. Rep. of Germany**

**Filed Nov. 8, 1979, Ser. No. 92,926**

**Claims priority, application Fed. Rep. of Germany, Nov. 8, 1978, 2848436**

**Int. Cl.**[3] **B65B** *3/02*

**U.S. Cl. 141—115** **11 Claims**



1. A fill device for filling a system, via a fill pipe thereof, with a liquid to a selected fill level, at least one liquid supply line and one extraction line being connected to said device and said device comprising: a housing; a rod axially displaceably mounted in said housing with one end of said rod forming a liquid outlet opening arranged to extend into the fill pipe to the selected fill level; flow control means connected between said outlet opening and the supply and extraction lines and operable to connect a selected one of those lines to said outlet opening; clamping means mounted in the region of said outlet opening and operable to clamp said device onto the fill pipe; and operating means operatively associated with said rod, said flow control means and said clamping means for causing displacement of said rod relative to said housing to simultaneously control operation of said flow control means and clamping means.

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**4,298,041**

## APPARATUS FOR DISPENSING FILM-LIKE LIQUID INTO VERTICAL PIPES

**Vincenzo Lagana', and Riccardo Pasero, both of Milan, Italy, assignors to Snamprogetti S.p.A., Milan, Italy**

**Filed Nov. 27, 1979, Ser. No. 97,786**

**Claims priority, application Italy, Dec. 15, 1978, 30886 A/78**

**Int. Cl.**[3] **B65B** *3/06*

**U.S. Cl. 141—392** **7 Claims**

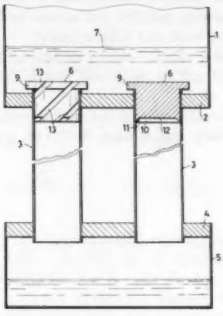
1. A distributor for causing liquid to be conveyed in the form of a film on the inner walls of essentially vertical tubes open at their top ends to an accumulator containing the liquid to be distributed and open at their bottom ends to a receiver for the distributed liquid, comprising:

cylindrical members slidably insertable in the upper ends of the tubes, wherein each of said members includes:

a ledge at its upper end which abuts the upper end of the

tube to limit the insertion of said member to the upper end thereof,

helical grooves in the outer surface of said member which extend from the top of said ledge to the bottom of said member and which are open to the inner wall of the tube therebetween for receiving the liquid from the accumulator and conveying such liquid within and along the length



of said helical grooves and from the lower ends thereof onto the inner tube wall, and

a convex circular rim at the lower end of said member which directs the flow of the liquid from said grooves outwardly onto the inner tube wall where it forms a film of liquid thereon and flows downwardly along its length into the receiver.

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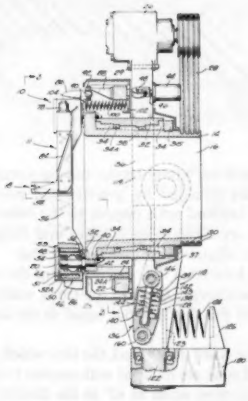
**4,298,042**

## ROTARY DELIMBER FOR TIMBER HARVESTER

**Waino Peltola, Rte. 1, Tripoli, Wis. 54564**

**Filed Sep. 6, 1979, Ser. No. 72,880**
**Int. Cl.³ B27L *1/00***
**U.S. Cl. 144—2 Z** **6 Claims**



1. Apparatus for delimbing trees comprising a rotor having an axial throat adapted to receive the trunk of a tree, a cutter, and means for supporting said cutter on said rotor to yieldably afford displacement of said cutter about first and second axes, and wherein said means for supporting said cutter on said rotor to yieldably afford displacement about a first axis includes a cutter arm, means for rotatably connecting said cutter arm to said rotor, and a torsion spring for yieldably biasing said cutter arm inwardly toward the axis of said rotor, and wherein said means for supporting said cutter on said rotor to yieldably afford displacement about a second axis comprises a spindle connected to said cutter, and means for rotatably supporting said spindle on said cutter arm, a torsion bar on said cutter arm, one end of said torsion bar being connected to said cutter arm and the other end being connected to said spindle.

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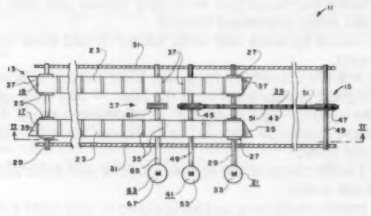
**4,298,043**

## LOG TRANSPORT SYSTEM

**David E. Seffens, Monroe, La., assignor to H. Jack Flanders Co., Little Rock, Ark.**

**Filed Apr. 28, 1980, Ser. No. 144,233**
**Int. Cl.³ B27B *31/00***
**U.S. Cl. 144—136 R** **7 Claims**



1. A transport system for transporting an object, said system comprising:

(a) first conveyor means for transporting the object, said first conveyor means including first and second conveyor members, said first and second conveyor members being arranged side-by-side a spaced apart distance, said first conveyor means including drive means for synchronously driving said first and second conveyor members;

(b) means for forming a transport surface in the object as the object is transported by said first conveyor means; and

(c) second conveyor means for transporting the object, said second conveyor means including a conveyor member for engaging the transport surface in said object and including drive means for driving said conveyor member, a portion of said conveyor member of said second conveyor means extending between said first and second conveyor members of said first conveyor means for positively supporting the object as it is transported between said first and second conveyor means.

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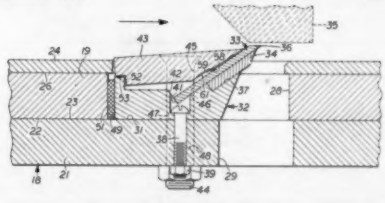
**4,298,044**

## WOOD CHIPPER

**Sydney Hansel, Arlington, Wash., and Thomas N. Baker, Thiensville, Wis., assignors to The Filer and Stowell Company, Milwaukee, Wis.**

**Filed Jan. 21, 1980, Ser. No. 113,517**
**Int. Cl.³ B27C *7/10***
**U.S. Cl. 144—176** **7 Claims**



1. A wood chipper comprising,

(a) a drive shaft mounted for rotation in a supporting housing,

(b) a disc unit having a pair of adjacent disc elements mounted on said drive shaft for rotation therewith the

inner surface of one said disc element in face-to-face relationship with the inner surface of the other said disc element,

(c) means securing said one disc element to said other disc element,

(d) angularly spaced aligned passageways through said one disc element and said other disc element,

(e) there being a recess in said one disc element at the trailing side of each angularly spaced passageway therethrough as viewed in the direction of rotation of said disc unit,

(f) a knife holder mounted within each said recess in said one disc element with the end of said knife holder removed from said aligned passageways being spaced from said one disc element to define means therebetween for receiving a babbit-like metal that accurately locates said knife holder and limits movement thereof,

(g) means securing said knife holder to said other disc element,

(h) a knife carried by each said knife holder adjacent said aligned passageways with the edge of said knife opposite its cutting edge engaging an abutment carried by said knife holder so that said knife holder takes the thrust of said knife,

(i) a knife clamp at the opposite side of said knife from said knife holder,

(j) means connecting said knife clamp to said knife holder to secure said knife therebetween,

(k) interlocking means carried by said knife clamp and said knife holder engaging each other and limiting relative movement therebetween both axially and radially to maintain accuracy of the knives relative to each other in all directions, and

(l) means to feed wood to one side of said disc unit so that the wood is cut into chips which pass through said aligned passageways to the other side of said disc unit.

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**4,298,045**

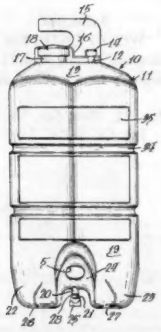
## DISPENSING CONTAINER WITH PLURAL REMOVABLE CLOSURE MEANS UNITARY THEREWITH

**Gerhard H. Weiler, South Barrington, and Henry Komendowski, Des Plaines, both of Ill., assignors to Automatic Liquid Packaging, Inc., Arlington Heights, Ill.**

**Division of Ser. No. 896,978, Apr. 17, 1978, Pat. No. 4,239,726. This application Feb. 1, 1980, Ser. No. 117,455**

**Int. Cl.³ B65D *30/00*; A45C *00/00***

**U.S. Cl. 150—0.5** **5 Claims**



**1.** A unitary, hermetically-sealed dispensing container, suitable for containing a sterile solution, which comprises

a hollow, generally tubular body of thermoplastic material closed at both ends, defining an enclosure having first and second access apertures and provided at one of said ends with a first hollow stem means having a bore of predetermined configuration and surrounding the first access aperture and at the other of said ends with a second hollow stem means having a predetermined outer side surface configuration and surrounding the second access aperture, the end provided with said second access aperture being bifurcated so as to define a pair of pockets;

a unitary sleeve member bridging said pockets and defining a confined flow passageway therebetween, said second hollow stem means communicating with said confined flow passageway, said first and second hollow stem means being unitary with said tubular body;

a first removable closure means for sealing said first access aperture and unitary with said first hollow stem means; and

a second removable closure means for sealing said second access aperture and unitary with said generally tubular body.

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**4,298,046**

## WINTER TIRE

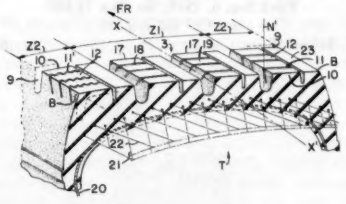
**Yves Herbelleau, Gourbeyre, and Charles Flechtner, Clermont-Ferrand, both of France, assignors to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France**

**Continuation-in-part of Ser. No. 18,850, Mar. 8, 1979, abandoned. This application Jul. 9, 1980, Ser. No. 167,068**

**Claims priority, application France, Jul. 24, 1979, 79 19253**

**Int. Cl.³ B60C *11/12***

**U.S. Cl. 152—209 R** **7 Claims**



**1.** A tire intended for winter travel, having a tread comprising relief elements bounded by grooves and provided with consecutive slits inclined with respect to the outer normal to the tread which are close to each other and form strips between each other, characterized by the fact that

(a) the slits are located in the central zone of the tread width and in the two lateral zones of the tread width;

(b) the depth of the slits is about equal to the depth of the grooves;

(c) when the tire is not under load, the slits which are located in the central zone are inclined with respect to said normal by an angle at most equal to 45° in the direction opposite the direction of forward rotation of the tire so as to be active in braking and the slits which are located in the two lateral zones are inclined with respect to said normal by an angle at most equal to 45° in the direction of forward rotation of the tire so as to be active in longitudinal acceleration;

(d) the slits have a width which is other than zero and such that, when the tire is under load and and crushed on the ground, the slits are closed; and

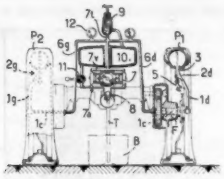
(e) the tread comprises a radial carcass reinforcement surrounded by a tread reinforcement.

**4,298,047**

## BALLASTING AND INFLATION APPARATUS

**Emile Bobard, Beaune, France, assignor to Bobard Jeune, S.A., Beaune, France, a part interest**

**Filed Feb. 11, 1980, Ser. No. 120,326**
**Claims priority, application France, Feb. 12, 1979, 79 03687**
**Int. Cl.³ B60C *23/10, 29/00***
**U.S. Cl. 152—417** **13 Claims**



1. Apparatus for use with a vehicle having tires, said apparatus adapted to adjust the pressure of fluid within said tires when said tires are inflated with said fluid in the form of air, ballasting liquid, or a combination thereof, both when said vehicle is at rest and when said vehicle is moving, said apparatus comprising:

(a) a pump adapted to compress liquid or air to a predetermined inflation pressure;

(b) a discharge valve adapted to adjust said predetermined inflation pressure;

(c) a reservoir adapted to receive and store said liquid;

(d) a nozzle associated with each of said tires, each nozzle comprising a fluid feed passageway and a fluid purge passageway, each nozzle adapted to occupy a first, generally upright position in which said nozzle is capable of purging up to 100% of air present in said tire and a second, generally downwardly directed position in which said nozzle is capable of purging up to 100% of liquid present in said tire; and

(e) a piping system interconnecting said pump to said nozzles, said reservoir, and said valve.

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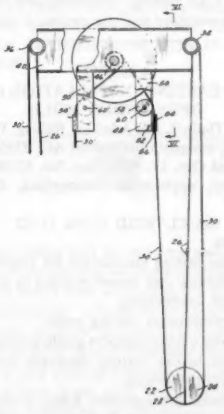
**4,298,048**

## ROLL-UP DIVIDER

**Max F. Roller, 7230 N. Keystone, Lincolnwood, Ill.**

**Filed Mar. 23, 1977, Ser. No. 780,529**
**Int. Cl.³ A47G *5/02*; E06B *9/204***
**U.S. Cl. 160—243** **3 Claims**



1. A roll up divider comprising:

a flexible curtain having top and bottom marginal edges;

a cylindrical member attached to the bottom marginal edge for winding and unwinding said curtain;

a web embracing said cylindrical member with curtain material, when wound thereon, intermediate said web and said cylindrical member;

support means fixedly supporting one end of said web and said top marginal edge of said curtain at an overhead location;

a rotatably mounted shaft spaced from said top marginal edge at another overhead location, the other end of said web attached to said shaft;

drive means connected to said shaft and operable to rotate said shaft in either direction to wind said web thereon and unwind said web therefrom to cause a corresponding winding of said curtain about said cylindrical member and unwinding of said curtain from said cylindrical member; and

a fair lead for contacting and guiding said web so that said web is prevented from wandering and winds upon itself, said fair lead comprising a roller spaced from said shaft and parallel thereto for rollingly engaging and supporting said web, and a pair of other rollers mounted parallel to each other to engage and guide the edges of said web.

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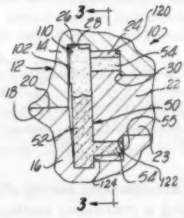
**4,298,049**

## METHOD FOR ASSEMBLING MOLDS

**Gary D. Counselor; Robert C. Gerst, and Reginald A. Pennington, all of Muskegon, Mich., assignors to Westran Corporation, Muskegon, Mich.**

**Filed Aug. 17, 1979, Ser. No. 67,378**
**Int. Cl.³ B22C *9/10, 9/24***
**U.S. Cl. 164—30** **6 Claims**



1. A method for assembling molds comprising: providing a mold comprising a cope and a drag, said cope and said drag having mating surfaces which abut together and define a casting cavity between the cope and the drag; providing a core carried by said cope and said drag and positioned within said cavity,

said core including at least one elongated protrusion extending into said cavity in a direction substantially parallel to the mating surfaces of said cope and said drag whereby said protrusion forms an opening in the casting with an axis extending in a direction substantially parallel to the mating surfaces of said cope and said drag, providing said cope and said drag with end surfaces defining portions of said cavity and extending substantially normal to said mating surfaces,

providing said drag with casting cavity surfaces defining a locator corner against which an edge of said core is adapted to abut,

providing a cam surface on said core, positioning said core in said drag such that an edge of said core abuts said locator corner and such that said core is in a position displaced from a proper position for casting, and engaging said cam surface with an end surface by moving said mating surfaces into mating relation to pivot said core about said locator corner thereby moving said core from said displaced position to said casting position whereby the longitudinal axis of said protrusion is substantially parallel to

the mating surfaces of said cope and said drag to thereby properly position a hole to be formed in said casting.

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4,298,050

## PROCESS FOR CONTINUOUS CASTING OF A SLIGHTLY DEOXIDIZED STEEL SLAB

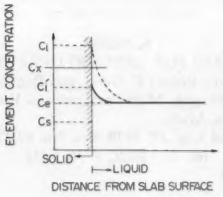
**Tetsro Ohashi; Osamu Kitamura; Hiromu Fujii; Seizo Mineyuki, and Eiichi Takeuchi, all of Himeji, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan**

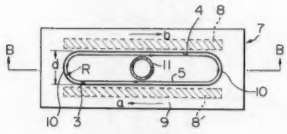
**Filed Nov. 6, 1979, Ser. No. 91,813**

**Claims priority, application Japan, Nov. 6, 1978, 53/135776; Sep. 10, 1979, 54/116030**

**Int. Cl.³ B22D** *27/02, 11/00*

**U.S. Cl. 164—468** **11 Claims**




1. A process for the continuous casting of a slab of slightly deoxidized steel, using a continuous casting powder and an immersion nozzle which is immersed into molten steel within a mold having two short sides and two long sides, which process comprises the steps of:

casting into said mold molten steel having a concentration of free oxygen in the range of from 50 to 200 ppm,

providing the inner surface of both short sides of said mold with a concave shape, as viewed in a horizontal cross section of said short sides,

locating a device for generating an electromagnetic force at each of both long sides of said mold and above an outlet port of said immersion nozzle,

orienting the propulsion force of said device for generating the electromagnetic force in directions along said long sides opposite to one another,

energizing said device for generating a flow of said molten steel having an essentially constant flow speed, said flow horizontally rotating entirely around a solidification interface and in the proximity thereof, said solidification interface being the interface between a solidification layer of the steel and said molten steel, said flow being formed from the position of the molten steel surface within the mold to the proximity of a predetermined vertical position on said solidification interface where the thickness of said solidification layer is greater than the amount of scale off, and

providing said horizontal flow with a flow speed in the range of from 0.1 to 1.0 m/sec.

4,298,051

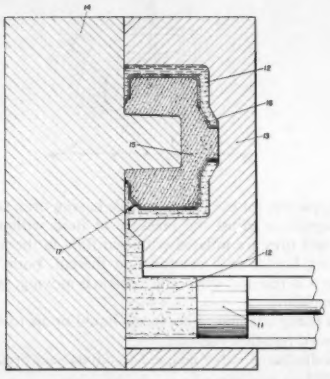
## METHOD OF DIE CASTING UTILIZING EXPENDABLE SAND CORES

**Enno H. Page, Toledo, Ohio, assignor to NL Industries, Inc., New York, N.Y.**

**Continuation-in-part of Ser. No. 909,468, May 25, 1978, abandoned. This application Sep. 25, 1979, Ser. No. 78,794**

**Int. Cl.³ B22C** *3/00, 9/10;* **B22D** *17/20*

**U.S. Cl. 164—72** **7 Claims**




1. A method for forming a die casting having an undercut region from molten metal, comprising: injecting molten metal into a die casting mold having a casting surface that includes at least one expendable sand core that forms an undercut region on said die casting, said core consisting essentially of from about 0.3% to 3.5% by weight of foundry sand of a binder consisting essentially of a boronated aluminum phosphate containing boron in an amount from about 3 mole % to about 40 mole % based upon the moles of aluminum and containing a mole ratio of phosphorous to total moles of aluminum and boron of about 2:1 to about 4:1, an effective amount of a hardening agent to react with the aluminum phosphate and to harden said binder to the extent that said core can be handled without damage and; water in an amount from 15% to 50% by weight based upon the total weight of boronated aluminum phosphate and water; balance essentially foundry sand; permitting said injected molten metal to solidify along said casting surface to form a die casting; removing said die casting from said mold; and separating said die casting from said core.

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4,298,052

## CONTINUOUS CASTING INSTALLATION CONTAINING OPEN-ENDED MOLD

**Bernhard Knell, Thalwil, and Adalbert Röhrig, Wädenswil, both of Switzerland, assignors to Concast AG, Zürich, Switzerland**

**Filed Oct. 11, 1979, Ser. No. 83,980**

**Claims priority, application Switzerland, Oct. 27, 1978, 11114/78**

**Int. Cl.³ B22D** *11/04, 11/12*

**U.S. Cl. 164—416** **6 Claims**

1. A continuous casting installation for casting molten steel to form a continuously cast strand moving in a predetermined direction of travel, comprising:

an oscillating continuous casting mold;

at least a partially curved support guide arrangement following the mold in the casting direction for supporting a partially solidified strand;

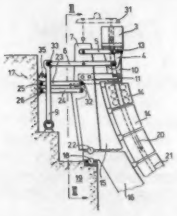
said support guide arrangement being divided into a first support structure directly beneath the mold and a subsequent support structure being further divided into exchangeable upper and lower segments;

a support frame carrying said mold and said first support structure of said support guide arrangement;

a machine base frame having an upper portion, said upper portion carrying a plurality of said exchangeable upper segments;

said machine base frame carrying a plurality of said exchangeable lower segments;

said support frame, said upper portion of said machine base frame and said machine base frame each being supported at a common location for independent movement relative to each other;



said support frame and said upper portion of said machine base frame being separately supported by a common foundation at about the same height, said upper portion of said machine base frame extending along a portion of the length of said support frame; and

said upper portion of said machine base frame and said support frame being movably supported by said foundation so that independent heat expansion of each of said frames in the direction of strand travel is allowed.

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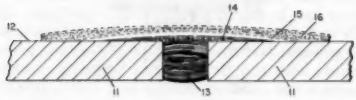
**4,298,053**

## CASTING BELTS FOR MACHINES FOR THE CONTINUOUS CASTING OF METALS

**John Dompas, Olen, Belgium, and Charles J. Petry, Winooski, Vt., assignors to Metallurgie Hoboken-Overpelt, Brussels, Belgium**

**Filed Mar. 7, 1975, Ser. No. 556,370**
**Claims priority, application France, Mar. 18, 1974, 74 09061**
**Int. Cl.³ B22D *11/06*; B23K *28/00***
**U.S. Cl. 164—429** **2 Claims**



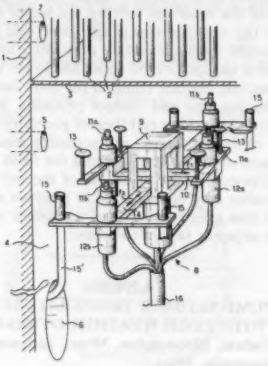
1. An endless casting belt for use on a machine for the continuous casting of metals, said endless belt consisting essentially of a belt of mild killed steel containing 0.2 to 0.8% by weight of titanium, said belt having been welded together at its ends in a "welding zone" to form an endless belt, an 0.05 mm thick primer layer of an 80:20 nickel-aluminum alloy overlying said welding zone, a first coating between 0.01 and 0.5 mm thick covering said primer layer, said first coating being selected from the group consisting of chromium, chromium alloy, nickel, nickel alloy and stainless steel, and a second coating of colloidal graphite covering said first coating.

**4,298,054**

## METHOD OF WITHDRAWING A MOBILE SENSOR FROM A HEAT EXCHANGER

**Andrev Adamowski, Paris, France, assignor to Intercontrole S.A., Rungis, France**

**Filed Jan. 25, 1980, Ser. No. 115,240**
**Claims priority, application France, Feb. 5, 1979, 79 03408**
**Int. Cl.³ F28F *11/00***
**U.S. Cl. 165—1** **8 Claims**



1. A method for withdrawing a mobile sensor apparatus from a header of a tubular heat-exchanger, the heat-exchanger having a closable access opening and the sensor apparatus having expansible mandrels by which the apparatus can be secured to tubes of the heat-exchanger and at least one guide tube by which a sensor can be introduced into a tube of the heat-exchanger to be inspected, said method comprising the steps of

introducing into one said guide tube and a tube of the heat-exchanger aligned therewith a dummy sensor mounted on a slightly flexible tube and carrying means by which it can be temporarily fixed within the heat-exchanger tube,

fixing the dummy sensor within the said heat-exchanger tube,

releasing the expansible mandrels of the sensor apparatus, and

sliding the apparatus along the tube of the dummy sensor to the access opening.

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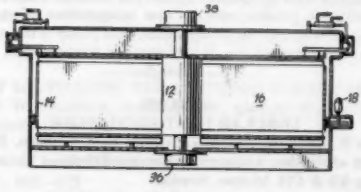
**4,298,055**

## ACTUATED SECTOR PLATE

**Kent E. Ritter, Wellsville, N.Y., assignor to The Air Preheater Company, Inc., Wellsville, N.Y.**

**Filed Aug. 27, 1980, Ser. No. 181,594**
**Int. Cl.³ F28D *19/00***
**U.S. Cl. 165—9** **7 Claims**



1. Rotary regenerative heat exchange apparatus having a rotor including a central rotor post and a concentric rotor shell spaced therefrom to provide an annular space therebetween, a mass of heat absorbent material carried in the annular space

between the rotor post and the rotor shell, a housing surrounding the rotor in spaced relation including inlet and outlet ducts at opposite ends thereof for a heating fluid and for a fluid to be heated, bearing means at opposite ends of the rotor adapted to support the rotor for rotation about its axis, means for rotating the rotor about its axis, a resilient sector plate intermediate the end of the rotor and the rotor housing adapted to maintain the heating fluid separate from the fluid to be heated, support means that holds the inboard end of the sector plate adjacent the inboard end of the rotor, a toggle type linkage at the outboard end of the rotor for moving the sector plate axially to conform to the configuration of the rotor, said linkage including a bell crank having an upper arm and a lower arm, fixed pivot means at the apex of the upper and lower arms of the bell crank connecting the bell crank to the rotor housing, an elongate link having one end thereof pivotally attached to the sector plate and the other end thereof pivotally attached to the lower arm of the bell crank, and actuating means for moving the upper arm of the bell crank about the fixed point whereby the angle formed by the lower arm of the bell crank and the linkage member may be increased to produce a vertical force component that effectively moves the sector plate vertically toward the adjacent face of the rotor.

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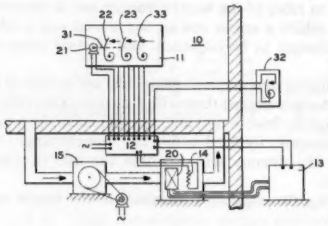
**4,298,056**

## HEAT PUMP SETBACK TEMPERATURE CONTROL WITH COLD WEATHER OVERRIDE

**Lorne W. Nelson, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.**

**Filed Jan. 21, 1980, Ser. No. 114,028**
**Int. Cl.³ F25B *29/00***
**U.S. Cl. 165—12** **5 Claims**




1. An improvement in a multistage setback time controlled thermostat control system for maintaining a normal temperature and during selected time periods a reduced temperature in a space wherein a first stage is adapted to control a refrigeration heat pump for furnishing heat to the space from the outside air and at least a second stage is adapted to control an auxiliary heating source for furnishing heat to the space, the improvement comprising,

an outdoor temperature responsive means adapted to be connected to said control system to maintain the refrigeration heat pump operative when the outdoor temperature is below a predetermined value independent of said first stage whereby the refrigeration heat pump is not allowed to stand inoperative at low outdoor temperatures.

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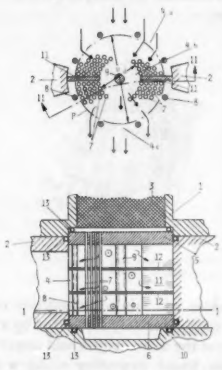
**4,298,057**

## TUBULAR HEAT-EXCHANGER

**Yngve R. Kihlberg, Akarp, and Johan E. P. Sjöholm, Bjärred, both of Sweden, assignors to Kommanditbolaget United Stirling AB & CO, Malmo, Sweden**

**Filed Apr. 6, 1979, Ser. No. 27,809**
**Int. Cl.³ F28F *9/22, 7/10***
**U.S. Cl. 165—159** **6 Claims**

1. In a tubular heat-exchanger of the kind having a plurality of parallel tubes through which a first fluid flows and which are disposed within walls defining a space or chamber through which a second fluid flows around the tubes and generally in directions substantially perpendicular or transverse to the tubes, the improvement comprising the tubes being regularly and evenly distributed around a central axis parallel to the direction of the tubes, the tubes being located within a ring-shaped zone having a cross-sectional area of which the inner diameter is at least 25 percent of the outer diameter, and the heat-exchanger includes means for radially converging the flow of the second fluid to enter and pass through the region



defined by said inner diameter and then radially diverging the flow of the second fluid exiting said defined region, said converging-diverging means providing converging and diverging flow within said ring-shaped zone and including two baffle plates each protruding radially into said ring-shaped zone to about said inner diameter from the walls bounding the space or chamber in which the tubes are disposed, the second fluid entering the vicinity of the tubes past one portion of the outer periphery of said zone and exiting past a second portion of the outer periphery different from said one portion.

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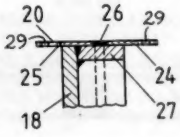
**4,298,058**

## TUBE BUNDLE HEAT EXCHANGER

**Jörg Wochele, Zofingen, Switzerland, assignor to BBC, Brown, Boveri & Company Limited, Baden, Switzerland**

**Filed Apr. 26, 1979, Ser. No. 33,421**
**Claims priority, application Switzerland, Apr. 28, 1978, 4629/78**
**Int. Cl.³ F28F *9/22;* F28D *7/10***
**U.S. Cl. 165—161** **4 Claims**




1. A tube bundle heat exchanger for exchanging heat between a first fluid and a second fluid, comprising:

a first casing;

a second pressure-tight casing mounted about said first casing such that said first casing is freely movable in its longitudinal direction within the second casing;

pressure equalizing means included on said first casing for approximately equalizing the pressure in the region enclosed by said first casing to the pressure in the region between said first casing and said second casing;

a plurality of heat exchanger tubes contained in said first

casing, each tube having an inner surface and an outer surface, one of said surfaces being in communication with said first fluid, and the other of said surfaces being in communication with said second fluid;

zigzag-shaped dividing wall means, defining oblique wall sections, and baffle means for forming a conduit for directing the flow of said second fluid such that the flow is substantially only diagonal to said heat exchanger tubes; said dividing wall means extending longitudinally with respect thereto being fixedly connected between adjacent heat exchanger tubes and

said baffle means including baffles which are tightly connected to said first casing and which extend normal to said heat exchange tubes.

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**4,298,059**

## HEAT EXCHANGER AND PROCESS FOR ITS MANUFACTURE

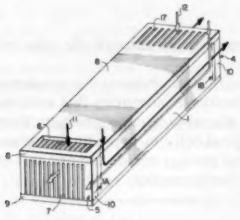
**Axel Krauth; Horst R. Maier; Hans-Juergen Phlmann, all of Selb; Siegfried Foerster, Alsdorf, and Manfred Kleeman, Quadrath, all of Fed. Rep. of Germany, assignors to Rosenthal Technik AG, Selb and Kernforschungsanlage Juelich GmbH, Juelich, both of, Fed. Rep. of Germany**

**Filed Sep. 24, 1979, Ser. No. 77,893**

**Claims priority, application Fed. Rep. of Germany, Sep. 23, 1978, 7828445**

**Int. Cl.³ F28F *3/00***

**U.S. Cl. 165—166** **5 Claims**



1. A recupertive heat exchanger, comprising:

a body of ceramic material having longitudinal ends, outer walls and a plurality of generally parallel flow channels arranged adjacently to one another generally axially with respect to said body, said flow channels having longitudinal sides which extend axially with respect to said body and a pair of frontal sides disposed at the axial ends of said flow channels, certain of said longitudinal sides being located immediately adjacent said outer walls, each of said flow channels including orifices for the entry and exit of flow media, said orifices including an orifice in one specific frontal side of each flow channel and an orifice in one of said certain longitudinal sides thereof, said flow channels extending over the entire length of said body from one longitudinal end to the other, adjacent flow channels having a common partition wall, said plurality of flow channels including a plurality of first flow channels for carrying a first heat transfer medium and a plurality of second flow channels, alternatingly arranged with respect to said first flow channels, for carrying a second heat exchange medium, each of said flow channels extending over its entire length next to the channel which is directly adjacent to it, said first channels having an inlet positioned on one lateral side of said body near a first longitudinal end of said body and an outlet positioned in the opposite, second longitudinal end of said body, and said second flow channels having an inlet positioned on one lateral side of said body near said second longitudinal end of said body and an outlet in said first longitudinal end of said body, said flow channels also being closed at their frontal sides and along their longitudinal sides except for said orifices in said specific frontal sides of said flow channels and said orifices in said certain longitudinal sides thereof, said orifices in said certain longitudinal sides being inlet orifices at least partially defining said inlets, said orifices in said specific frontal sides being outlet orifices at least partially defining said outlets.

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**4,298,060**

## FLUID JACKET FOR A VESSEL

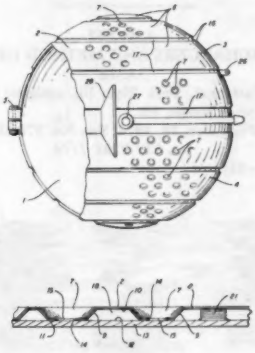
**Tecwyn L. Williams, Cowes, England, assignor to Elliott Turbomachinery Limited, England**

**Filed Aug. 13, 1979, Ser. No. 66,121**

**Claims priority, application United Kingdom, Feb. 14, 1979, 5218/79**

**Int. Cl.³ F28F *3/12***

**U.S. Cl. 165—169** **3 Claims**



1. A heat exchange apparatus comprising a vessel having curved exterior surface and a fluid jacket disposed about the curved exterior surface of said vessel, said fluid jacket comprising a plurality of sheets of relatively thin, complimentarily curved, material disposed on the exterior surface of said vessel; each of said sheets having a plurality of relatively small depressions spaced about the surface thereof and extending generally radially inwardly into engagement with, and being sealingly secured to the exterior surface of said vessel, thereby defining a fluid flow channel between the exterior surface of said vessel and said sheets; at least portions of the edges of each of said sheets being turned generally radially inwardly into contact with and being sealingly secured to the exterior surface of said vessel; at least a portion of an edge of selected pairs of adjacent sheets extending outwardly and being sealingly secured to the corresponding adjacent edge portion of the other of said pairs of adjacent sheets to provide an interconnecting fluid flow channel for communicating the fluid flow channels and to provide a desired fluid flow path across the surface of said vessel; and said heat exchange apparatus having a fluid inlet passage and a fluid outlet passage for passing fluid to and from said fluid flow channels.

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**4,298,061**

## HEAT EXCHANGER WITH CRIMPED FLANGE SEAM

**Russell W. Hoeffken, Belleville, Ill., assignor to The Singer Company, Stamford, Conn.**

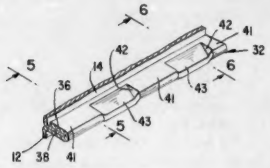
**Filed Aug. 15, 1980, Ser. No. 178,338**

**Int. Cl.³ F24H *3/00*; F28F *3/10, 3/12***

**U.S. Cl. 165—170** **4 Claims**

1. A heat exchanger unit for a hot-air furnace having complementary sides with engaged flanges along one or more edges of the unit where a flange on one side is folded over a flange on the other side, the folded flange on the one side and flange on the other being crimped together along resulting seams into one set of lengthwise spaced edge portions extend-

ing in one direction with respect to a longitudinal plane dividing the complementary sides of the heat exchanger, and into




another set of longitudinally spaced edge portions extending between the first mentioned portions in another direction with respect to the said plane.

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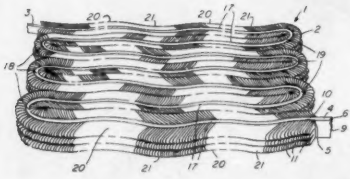
**4,298,062**

## HEAT EXCHANGERS AND METHOD OF MAKING SAME

**Stephen F. Pasternak, Park Rige, Ill., assignor to Peerless of America, Inc., Chicago, Ill.**

**Filed Dec. 18, 1978, Ser. No. 970,438**
**Int. Cl.³ F28F *1/14***
**U.S. Cl. 165—181** **33 Claims**




1. A heat transfer element comprising

a. an elongated conduit having a passageway for working fluid extending longitudinally therethrough,

b. a plurality of fins disposed in spaced relation to each other (1) longitudinally of said conduit,

(2) on two oppositely disposed sides of the latter

c. said fins on each of said sides projecting outwardly away from said fins on the other of said sides,

d. adjacent ones of said fins on each of said sides defining a passageway therebetween

e. said conduit having a plurality of longitudinally extending undulations, projecting in opposite directions relative to the longitudinal axis of said conduit,

f. said undulations being in a direction relative to the length of said conduit transverse to the direction said two sides of said conduit are disposed relative to each other,

g. certain of said passageways on each of said sides being disposed substantially perpendicular to the length of said conduit, and

h. passageways on opposite sides of said certain passageways being disposed in progressively oppositely diverging angles to said certain passageways.

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**4,298,063**

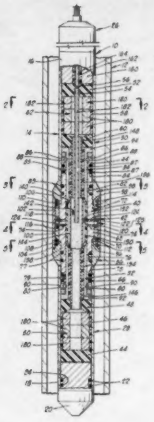
## METHODS AND APPARATUS FOR SEVERING CONDUITS

**John A. Regalbuto, and Glenn B. Christopher, both of Forth Worth, Tex., assignors to Jet Research Center, Inc., Arlington, Tex.**

**Filed Feb. 21, 1980, Ser. No. 123,225**
**Int. Cl.³ E21B *29/02***
**U.S. Cl. 166—55** **38 Claims**

1. Apparatus for severing a conduit along a plane extending transversely through the conduit comprising:

an elongated housing adapted to be removably positioned within said conduit, said housing forming a pair of longitudinally spaced-apart fuel chambers therewithin communicated by an impingement passage extending longitudinally between said fuel chambers and having a plurality of fuel reaction products discharge nozzles communicated with said impingement passage said discharge nozzles being located longitudinally intermediate said fuel chambers and



disposed transversely through the sides of said housing; and

means attached to said housing for simultaneously igniting solid non-explosive incendiary fuel contained in said fuel chambers whereby reaction products formed therefrom travel longitudinally in opposite directions through said impingement passage collide and exit said housing by way of said discharge nozzles.

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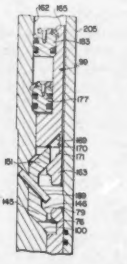
**4,298,064**

## REMOTELY OPERATED COUPLING AND WELL DEVICES EMPLOYING SAME

**John E. Lawson, London, England, assignor to Armco Inc., Middletown, Ohio**

**Filed Feb. 11, 1980, Ser. No. 120,047**
**Int. Cl.³ E21B *33/035***
**U.S. Cl. 166—75 A** **14 Claims**




1. In a remotely operated coupling for connecting a load to an upper member from which the load is to be suspended, the combination of

a first member to be connected to the load, the first member having a first frustoconical shoulder;

a coupling member;

means carried by the coupling member and having a second frustoconical shoulder which can be spaced below the

first shoulder so as to be parallel thereto with the first and a second shoulder then being spaced apart to define an annular space;

a piston disposed within said coupling member and having a transverse annular segment-retaining groove defined by frustoconical upper and lower side walls which are mutually parallel and spaced apart axially of the coupling member,

the side walls of the segment-retaining groove lying in frustoconical planes which slant downwardly to intersect the frustoconical planes of the first and second shoulders;

a plurality of arcuate coupling segments,

each of the coupling segments being of generally C-shaped radial cross section and including

an upper portion defined by mutually parallel frustoconical upper and lower faces,

a lower portion defined by mutually parallel frustoconical upper and lower faces, and

an intermediate portion joining the upper and lower portions,

the angle of taper of the frustoconical upper and lower faces of the upper portion being the same as the angle of taper of the frustoconical side walls of the segment-retaining groove of the piston,

the angle of taper of the frustoconical upper and lower faces of the lower portion being the same as the angle of taper of the first and second shoulders,

the coupling segments being arranged in an annular series with the upper portions of the segments slidably disposed in the segment-retaining groove of the piston;

means carried by the coupling member and having surface portions defining an annular recess of generally C-shaped radial cross section disposed to receive the coupling segments when the segments are moved radially away from the piston;

means carried by the coupling member and presenting surfaces coacting with the piston to define expansible chambers; and

means for supplying pressure fluid selectively to the expansible chambers to selectively drive the piston upwardly and downwardly relative to the coupling member;

the lower portions of the coupling segments being dimensioned to enter the space between the first and second shoulders when, as the piston is driven downwardly while the lower faces of the lower portions of the segments engage a second shoulder,

application of a downward load to the first member then causing the lower portions of the coupling segments to be clamped between the first and second shoulders and the load to be transferred to the coupling member via the first and second shoulders and the lower portions of the segments.

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**4,298,065**

## PITLESS ADAPTER

**Henry A. Baski, 1586 Robb Way, Denver, Colo. 80226**

**Filed Dec. 3, 1979, Ser. No. 99,831**

**Int. Cl.³ E21B *43/00***

**U.S. Cl. 166—88** **4 Claims**

1. A pitless adapter arranged for either a turbine pump or a submerged pump, comprising:

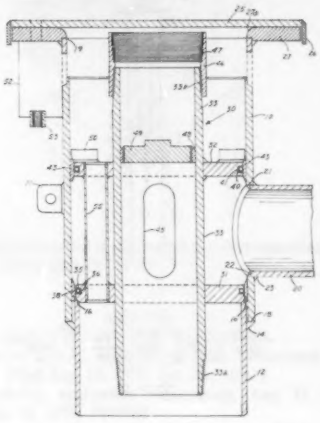
(a) a full diameter pipe arranged to extend from above ground surface to a well casing and having a diameter larger than the well casing so as to telescope over a connector with the end of the connector extending into the lower end of said full diameter pipe forming a spool seat and said full diameter pipe being connected to said well casing;

(b) a lateral pipe distributor secured to said full diameter pipe adjacent said lower end of full diameter pipe;

(c) a spool mounted in said full diameter pipe including upper and lower plates and a central pipe having at least one communication port to said full diameter pipe and said lateral pipe, sealing means between the circumference of each said plate and said full diameter pipe;

(d) said central pipe including connecting means to a drop pipe at its lower end and pulling means at its upper end;

(e) means for sealing said central pipe preventing a flow of fluid out of its top, including a seal ring internally of said central pipe above said at least one port;



(f) means engaging said seal means sealing said central pipe against upward flow of well fluid;

(g) at least one spacer ring being mounted between said full diameter pipe and the lower plate;

(h) and cap means for closing the top of said full diameter pipe.

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**4,298,066**

## PROCESS AND DEVICE FOR INJECTING A LIQUID AGENT USED FOR TREATING A GEOLOGICAL FORMATION IN THE VICINITY OF A WELL BORE TRAVERSING THIS FORMATION

**Jean Colonna, Joinville le Pont; Jean-Michel Fitremann, Carquefou; Richard Genin, Nantes, and Jean-Paul Sarda, Rueil-Malmaison, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France**

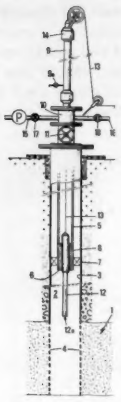
**Filed Jun. 20, 1980, Ser. No. 161,616**

**Claims priority, application France, Jun. 21, 1979, 79 16188**

**Int. Cl.³ E21B *33/138, 41/00, 43/27***

**U.S. Cl. 166—300** **11 Claims**

1. A process for placing a liquid treating agent in a zone of a geological formation adjacent a well bore, comprising positioning in the well bore a tubular column having a lower end located substantially at the level of the formation to be treated, the tubular column internally comprising holding abutment means near its lower end, lowering through said tubular column a spraying pipe of elongate shape, adapted for sealingly seating on said holding abutment means, spraying said liquid treating agent into the wall of the geological formation through said spraying pipe, by introducing from the ground surface, through said tubular column, said liquid agent and a pressurized gaseous fluid, wherein the inner diameter D and the length L of the injection pipe as well as the flow rate Q of the injected gaseous fluid are fixed as a function of the pressure prevailing at the level of the treated formation, of the density of the gaseous fluid, and of the interfacial tension of the liquid treating agent, so that the following relationships are both substantially satisfied:



$$D = k \cdot Q^{\alpha}\left(\frac{P_o}{P} \cdot \frac{\rho_o}{\sigma}\right)^{\beta} \text{ and}$$

$$\frac{L}{D} > 10,$$

D and L being expressed in meters,

$P_o$ being the value of the standard pressure (1 atmosphere),

P being the value of the pressure prevailing at the level of the formation, measured with the same unit as $P_o$,

Q being the injected gas flow rate, in $m^3$/second, measured under the standard temperature and pressure conditions,

$\rho_o$ being the specific gravity of the gas in $kg/m^3$, measured under the standard conditions,

$\sigma$ being the interfacial tension of the injected liquid agent, in Newton/meter,

$\alpha$ being a dimensionless coefficient having a value close to 0.5,

$\beta$ being a dimensionless coefficient having a value close to 0.25, and

k being a coefficient whose value is comprised between $2\times10^{-2}$ and $6\times10^{-2}$ with the above-defined units.

**6**. A device for spraying a liquid agent used for treating a geological formation in the vicinity of a borehole traversing the formation, the device comprising a tubular column positioned in the borehole and connected at its upper part with means for supplying the liquid treating agent and pressurized gaseous fluid thereto, the lower part of said tubular column being extended by an elongate pipe having a smaller internal diameter than the tubular column, the internal diameter D and the length L of the spraying pipe being such that the following relationships are both substantially satisfied:

$$D = k\,Q^{\alpha}\left(\frac{P_o}{P} \cdot \frac{\rho_o}{\sigma}\right)^{\beta} \text{ and}$$

$$\frac{L}{D} > 10,$$

D and L being expressed in meter,

$P_o$ being the value of the standard pressure (1 atmosphere),

P being the value of the pressure prevailing at the level of the formation, measured with the same unit as $P_o$,

Q being the injected gas flow rate, in $m^3$/second, measured under the standard temperature and pressure conditions,

$\rho_o$ being the specific gravity of the gas in $kg/m^3$, measured under the standard conditions,

$\sigma$ being the interfacial tension of the injected liquid agent, in Newton/meter,

$\alpha$ being a dimensionless coefficient having a value close to 0.5,

$\beta$ being a dimensionless coefficient having a value close to 0.25, and

k being a coefficient whose value is comprised between $2\times10^{-2}$ and $6\times10^{-2}$ with the above-defined units.

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**4,298,067**

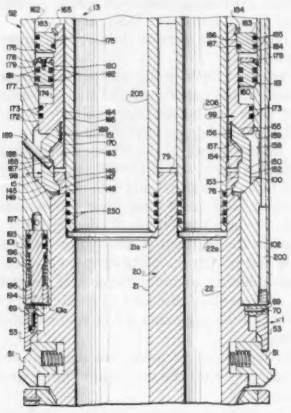
## METHOD AND APPARATUS FOR INSTALLING MULTIPLE PIPE STRINGS IN UNDERWATER WELLS

**John E. Lawson, London, England, assignor to Armco Inc., Middletown, Ohio**

**Filed Feb. 11, 1980, Ser. No. 120,851**

**Int. Cl.³ E21B *33/035***

**U.S. Cl. 166—315** **14 Claims**



**12**. In a well tool adapted to be landed in the upright bore of a support member and then rotated about an upright axis to a predetermined rotational position relative to the support member, the combination of

elongated body means having a cylindrical outer surface portion;

a support ring adapted to shoulder on the support member when the tool is landed;

an annular antifriction thrust bearing superimposed on said support ring,

said elongated body means extending through said bearing and said support ring with the capability of both rotating and moving axially relative to the bearing and the support ring;

means secured to said elongated body means and presenting a transverse annular shoulder located above and facing toward the thrust bearing;

load-transmitting means disposed between said thrust bearing and said shoulder,

said load-transmitting means being radially movable between an inner position, in which said load-transmitting means is aligned between said thrust bearing and said shoulder, and an outer position, in which said load-transmitting means is spaced outwardly of said shoulder, said load-transmitting means being resiliently biased to said outer position;

an annular retaining member carried by said elongated body means for movement between a lower position, in which said retaining member surrounds said load-transmitting means and holds said load-transmitting means in said inner position, and an upper position, in which said load-transmitting means is free to move to said outer position; and

means for moving said retaining member to said upper position.

4,298,068

## HEAT SENSITIVE RELEASE DEVICES

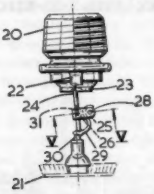
Geddes A. Bray, Moston, England, assignor to Mather & Platt Limited, Manchester, England

Division of Ser. No. 776,057, Mar. 9, 1977, abandoned. This application Dec. 15, 1978, Ser. No. 970,053

Claims priority, application United Kingdom, Mar. 12, 1976, 9915/76

Int. Cl.[3] A62C *37/08*

U.S. Cl. 169—39 7 Claims




1. A heat sensitive release device comprising first and second relatively movable components, and a normally stable strut system located between the components to retain them in fixed positions relative to each other but collapsible on attainment of a predetermined temperature, the strut system comprising:

(i) a heat sensitive element;

(ii) a catch element having opposed wings between which the heat sensitive element is retained;

(iii) a lever fulcrummed on the first component and bearing against the heat sensitive element;

(iv) a strut engaging at one end the lever adjacent the fulcrum and at its other end the second component and joined to the catch element to retain the lever and thereby the strut system in a stable condition;

(v) an impediment joined to the strut system and disposed between the lever and the strut to prevent lever movement towards the strut and removal of the heat sensitive element from the catch element said impediment being attached to the catch element, whereby on attainment of the predetermined temperature the heat sensitive element disengages from the wings of the catch element and permits the lever to pivot about the fulcrum to disengage the strut from the second component which together with the first component are both freed for relative movement.

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4,298,069

## SOIL CULTIVATING IMPLEMENTS

Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

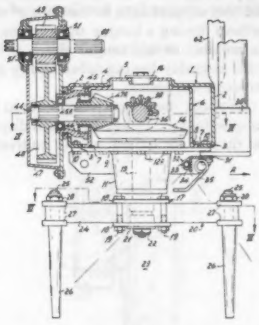
Filed Sep. 10, 1979, Ser. No. 73,862

Claims priority, application Netherlands, Sep. 11, 1978, 7809222; Sep. 11, 1978, 7809223

Int. Cl.[3] A01B *33/06, 33/14*

U.S. Cl. 172—59 11 Claims

1. A soil cultivating implement comprising a frame and a plurality of soil working members being supported on a portion of said frame, driving means connected to rotate said members about respective upwardly extending axes and said driving means including transmission gear means for each of said members, each member comprising a unitary gear casing that is releasably fastened to said frame portion, said frame portion being elongated and extending transverse to the direction of travel, the casings of said members being mounted along the length of said frame portion, said frame portion being inverted channel-shaped in cross-section with an upper apertured base and spaced apart, downwardly extending limbs, said casings being positioned between the downwardly extending limbs, a top portion of each casing comprising an upwardly



extending projection that is positioned in a corresponding hole of said base of the frame portion.

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4,298,070

## SOIL CULTIVATING MACHINES

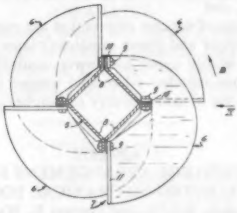
Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Filed Aug. 14, 1979, Ser. No. 66,639

Claims priority, application Netherlands, Aug. 18, 1978, 7808557; Aug. 18, 1978, 7808558

Int. Cl.[3] A01B *33/02, 33/14*

U.S. Cl. 172—123 19 Claims



1. A soil cultivating machine including a frame and a rotor journalled in said frame, said rotor comprising an elongated carrier that is rotatable about a substantially horizontally axis and a plurality of cultivating members mounted along the length of said carrier, each member being flat and extending outwardly from the axis of rotor rotation, the outer circumference of said member being curved and defining part of the perimeter of said rotor, a leading end of said circumference being located nearer said axis than a trailing end of said member, said trailing end comprising a rim that is bent-over through an angle of about 90°.

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4,298,071

## CULTIVATOR WITH PARALLEL QUADRANT PLATES FOR POSITIONING CULTIVATING ELEMENT

Carroll J. Whitfield, and Anthony W. Lastinger, both of Tifton, Ga., assignors to Kelley Manufacturing Co., Tifton, Ga.

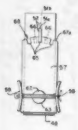
Division of Ser. No. 941,067, Sep. 11, 1978, Pat. No. 4,231,433. This application Jun. 2, 1980, Ser. No. 155,650

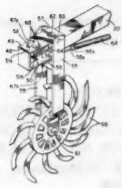
Int. Cl.[3] A01B *65/02*

U.S. Cl. 172—624 3 Claims

1. In a cultivator having an elongated tool bar extending generally transverse to the normal direction of travel of said cultivator, a longitudinally extending tool support arm mounted from said tool bar for movement about a transverse axis, the combination therewith of:

(a) means for mounting a cultivating tool on said tool support arm comprising a box member having substantially parallel upper and lower surfaces mounted on the distal end of said tool support arm, at least one of said upper and lower surfaces having a tongue slot therein,
(b) a tongue member in said tongue slot,
(c) a quadrant assembly having substantially parallel upper and lower quadrant plates,
(d) at least one shank member fixedly secured to said upper and lower quadrant plates having means disposed near the lower end thereof for mounting said cultivating tool,





(e) means defining a vertical axis through said box member for providing pivotal movement of said upper and lower quadrant plates with respect to said upper and lower surfaces, and
(f) a plurality of notches disposed at the edge of at least one of said upper and lower quadrant plates for securing the position of said upper and lower quadrant plates relative to said box member when said tongue member is registered in one of said plurality of notches.

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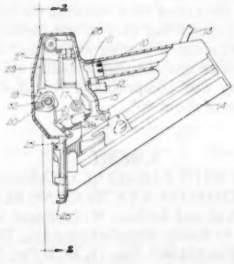
**4,298,072**

## CONTROL ARRANGEMENT FOR ELECTRO-MECHANICAL TOOL

**Gordon P. Baker, Amelia, and Thomas E. Warman, Williamsburg, both of Ohio, assignors to Senco Products, Inc., Cincinnati, Ohio**

**Filed Aug. 31, 1979, Ser. No. 71,721**
**Int. Cl.³ B25C *1/06***
**U.S. Cl. 173—13** **15 Claims**



1. An electric impact tool comprising an impact member, a manually actuated control means, a work responsive control means, an electric motor driven flywheel and a support element, said flywheel and said support element being positionable with respect to each other by a distance less than the thickness of said impact member, and a solenoid responsive to actuation of both said manually actuated and said work responsive control means, for introducing the impact member between the flywheel and support element when spaced from each other by a distance less than the thickness of said impact member.

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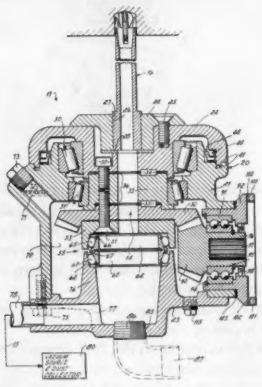
**4,298,073**

## DRILL HEAD

**George A. Yates, Grove City, Ohio, assignor to Eagle-Picher Industries, Inc., Cincinnati, Ohio**

**Filed May 3, 1979, Ser. No. 35,732**
**Int. Cl.³ E21B *7/02*; E21C *7/02***
**U.S. Cl. 173—22** **8 Claims**



1. A drill head comprising,
a housing including a lower cover enclosing the lower end of said housing and having no fixed upper cover,
a rotatable cap covering the upper portion of said housing,
a chuck removably mounted in said cap,
a set of radial-thrust bearings only in the upper portion of said housing for rotatably mounting said cap with respect to said housing, said bearings including adjacent tapered upper and lower rollers, said radial-thrust bearings providing the only radial and thrust support for said rotatable cap and chuck,
a cavity below said radial-thrust bearing set for lubricant,
a rotatable driven bevel gear having a vertical axis and located in said cavity below said radial-thrust bearing set and connected to said cap for rotation therewith,
a driving bevel gear having a horizontal axis and rotatably mounted in the side of said housing and meshing with said driven bevel gear,
a passageway from said chuck through the lower cover of said housing for drawing, by vacuum, the grit from a drill tool in said chuck,
and a rotary face seal in the lower cover of said housing below said driven bevel gear for providing a rotary seal between said lower cover and the driven bevel gear,
whereby said face seal can be removed and replaced by removing said lower cover and without disturbing the radial-thrust bearing set.

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**4,298,074**

## SURGICAL DEVICE USING IMPULSE MOTOR

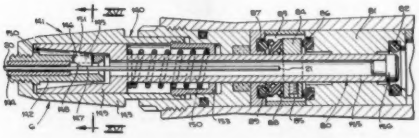
**Terry M. Mattchen, Van Nuys, Calif., assignor to American Safety Equipment Corporation, Detroit, Mich.**

**Filed Aug. 9, 1976, Ser. No. 712,728**
**Int. Cl.³ B25D *9/00*; A61B *17/18*; B23B *5/22***
**U.S. Cl. 173—129** **4 Claims**

2. In a surgical tool including an impulse motor, an output member for removing or breaking through tissue and impulse transmission means for transmitting impulses from the impulse

motor to the output member, a chamber and a piston hammer movable in the chamber from an initial position at the rear end of the chamber to an impacting position impacting the impulse transmission means at the forward end of the chamber, air supply means for supplying air to the ends of the chamber, valve means in the chamber for directing air to one or the other end of the chamber, and sensing means on the valve means for sensing the position of the piston hammer to change the valve means from directing air to one end of the chamber to directing air to the other end of the chamber, the improvement comprising:

the output means comprises a holding means for holding an impacting member, the impacting member being a wire, the holding means comprising guide means for supporting the impacting member, the impulse transmission means having a central bore aligned with the guide means for receiving a portion of the wire, gripping means extending through the guide means for gripping the impacting member and collet means around the guide means adjacent to the gripping means, the guide means and the collet means being movable relative to each other between a first position wherein the collet means urges the gripping means



into the guide means to grip the impacting member and a second position releasing the gripping means to release the impacting member, the guide means is an elongated tube having at least one aperture therethrough, the clamping means comprising a wafer extending through each aperture, the collet means having a tapered end having a larger inside diameter at the end of the tool where the wire is driven tapering to a smaller diameter away from said end of the tool, the aperture being under said tapered portion, the second position of the collet having the greater inside diameter over the aperture to allow the wafers to move radially outward away from the inside of the guide means and out of gripping contact with the wire to permit movement of the wire in the guide means, and the first position of the collet having the smaller inside diameter over the aperture to force the wafers radially inward into the guide means to grip the wire and prevent its movement in the guide means, means connecting the collet means to the impulse transmission means to transmit impulses to the collet means, means interconnecting the collet means to the gripping means and means connecting the gripping means with the wire for transmitting impulses from the collet means through the gripping means to the wire.

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**4,298,075**

## DRIVE MEANS FOR TRAFFIC DELINEATOR

**Lawrence J. Sweeney, Seneca, Pa., assignor to Franklin Steel Company, Franklin, Pa.**

**Filed Dec. 10, 1979, Ser. No. 101,440**
**Int. Cl.³ B23B *45/16***
**U.S. Cl. 173—129** **9 Claims**

7. A combination of a drive means for driving into the ground or a road surface a traffic delineator assembly of the type which includes a channel shaped anchor post having a pair of outwardly extending flanges, the upper end of the channel being connected to a solid plate member, and an adaptor for transmitting the impacts of an impact type drive tool to said drive means wherein:

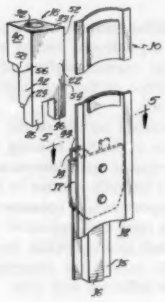
said drive means comprises;

a body having a lower surface for surface contact with the upper end of said anchor post,

a recess in an upper surface of said body,

and a pair of legs depending from said lower surface to straddle the channel of the anchor post and locate between the flanges of said anchor post and said plate member;

and wherein said adaptor comprises;



a shank;

a male member extending upward from said shank for insertion into a female member of the impact type drive tool;

and a linking member depending downward from said shank for insertion into said recess.

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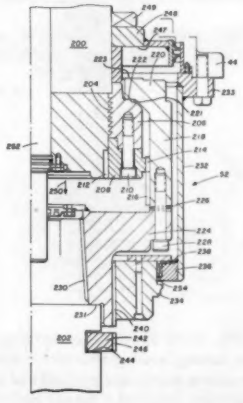
**4,298,076**

## CHUCK AND WRENCH ASSEMBLY FOR RAISE DRILL APPARATUS

**Jack O. Winsor, Seattle, Wash., and Dennis J. Patrick, Columbus, Ohio, assignors to Dresser Industries, Inc., Dallas, Tex.**

**Filed May 14, 1979, Ser. No. 38,753**
**Int. Cl.³ E21B *3/00, 7/22, 19/16, 19/18***
**U.S. Cl. 173—164** **15 Claims**



1. A chuck mechanism for a raise drill apparatus, comprising:

(a) a drive shaft;

(b) means for rotating the shaft;

(c) a thrust nut axially and rotatably fixed to the drive shaft and having an upper contact surface facing in the reaming direction;

(d) a bell housing enveloping the thrust nut and having upper and lower contact surfaces, said lower contact surface being adapted to be engaged by the upper contact

surface of the thrust nut for transmitting force to the bell housing in the reaming direction;

(e) A first coupling means for rotatably coupling the thrust nut and bell housing while allowing relative axial movement therebetween;

(f) a second coupling means for rotatably coupling a section of drill pipe to the bell housing co-axial with the drive shaft;

(g) an annular collar rotatably and axially fixed to the drive shaft and having a lower contact surface adapted to engage the upper contact surface of the bell housing for transmitting force to the bell housing in the pilot hole drilling direction;

(h) the upper contact surface of the thrust nut and lower contact surface of the bell housing and the first coupling means being shaped and dimensioned to allow the drill pipe to deflect laterally relative to the drive shaft; and

(i) an outer support means connected to a non-rotatable portion of the raise drill apparatus in the path of movement of the bell housing when the drill pipe deflects a predetermined amount for absorbing the moment load exerted by the deflected drill pipe.

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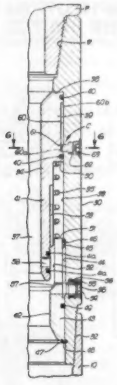
**4,298,077**

## CIRCULATION VALVE FOR IN-HOLE MOTORS

**Maurice M. Emery, Costa Mesa, Calif., assignor to Smith International, Inc., Newport Beach, Calif.**

**Filed Jun. 11, 1979, Ser. No. 47,296**
**Int. Cl.³ E21B *4/02***
**U.S. Cl. 175—65** **7 Claims**



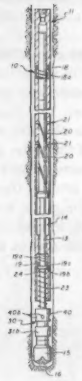
**1.** An in-hole motor apparatus comprising: an in-hole fluid driven motor having housing structure connectable to a pipe string for receiving motor driving fluid and a valve assembly; said valve assembly including a tubular body member having a side port; said side port communicating with the interior and exterior of said body member and said housing; a valve sleeve member having a flow passage longitudinally therethrough for the flow of fluid to said motor when communication between said side port and said exterior is closed; said valve sleeve being shiftable in said body member in response to fluid flow and interruptions of fluid flow between a first, second and third positions at which said side port is in sequence opened, closed and reopened, and control means for positioning said sleeve member in said first, second and third positions in said sequence.

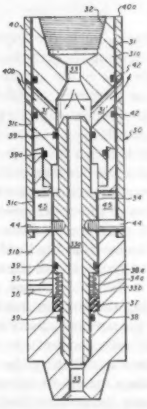
**4,298,078**

## METHOD OF INHIBITING STICKING OF WELL STRING

**James D. Lawrence, Houston, Tex., assignor to Dailey Oil Tool, Inc., Houston, Tex.**

**Division of Ser. No. 3,045, Jan. 12, 1979. This application Mar. 17, 1980, Ser. No. 130,852**
**Int. Cl.³ E21B *21/00***
**U.S. Cl. 175—72** **1 Claim**





**1.** A method of inhibiting well string sticking during operations in a well bore comprising the steps of:

a. connecting spring loaded, normally closed valve means in the well string;

b. lowering the well string to open the valve means; and

c. circulating fluid to discharge through a lower end of the well string and also out the open valve means into the well bore for flushing thereof.

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**4,298,079**

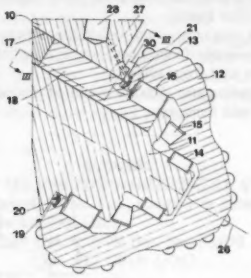
## ROTARY DRILL BIT

**Gösta Norlander, Surte, Sweden; Angelo Vignotto, and Mario Micca, both of Turin, Italy, assignors to Sandvik Aktiebolag, Sandviken and Aktiebolaget SKF, Göteborg, both of, Sweden**

**Filed Apr. 1, 1980, Ser. No. 136,351**
**Claims priority, application Sweden, Mar. 28, 1979, 7902763**
**Int. Cl.³ E21B *10/18, 10/22;* F16J *15/32***
**U.S. Cl. 175—339** **15 Claims**

**1.** A rotary roller bit comprising a head having a bearing shaft, at least one roller cutter, said roller cutting being rotat-

ably carried on said bearing shaft over bearing means and having an annular sealing means, said annular sealing means being disposed in an annular gap between said head and roller cutter for sealing said bearing means, characterized in that said sealing means comprises a main body and an elastically yieldable tongue firmly attached to said main body of the sealing means, said tongue being formed of a nonmetallic elastic material and having a length substantially exceeding its thickness, said tongue extending from said main body in a direction having a radial component relative to the rotational axis of the roller cutter so that its free end is radially spaced from its end being attached to the main body of the sealing means, thereby causing axial or wobbling movements of the roller cutter relative to the head to be taken up mainly by the yielding movement of tongue relative to the main body.

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**4,298,080**

## ROCK CUTTING TOOLS

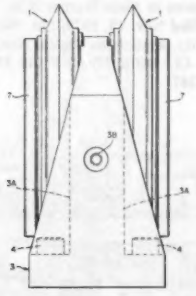
**Henry J. Hignett, Reading, England, assignor to Secretary of State for Transport in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England**

**Filed May 25, 1978, Ser. No. 909,444**

**Claims priority, application United Kingdom, May 25, 1977, 22129/77**

**Int. Cl.³ E21D *9/10*; E21C *35/18***

**U.S. Cl. 175—373** **10 Claims**




1. A full-face rock tunnelling tool comprising a pair of disc cutters disposed in parallel, said disc cutters each having a peripheral cutting edge defined by a V-shaped circumferential portion; a support member for said cutters disposed radially inwardly of the cutting edges thereof, and on which each cutter is borne for rotation independently of the other; and a mounting pedestal to which said member is attached between planes defined by the respective cutting edges of the cutters.

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**4,298,081**

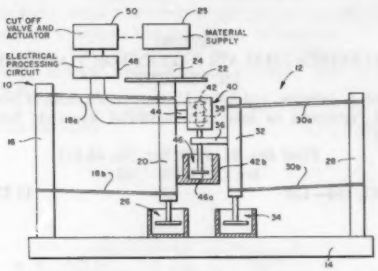
## DIFFERENTIAL WEIGHING SYSTEM PROVIDING IMPROVED SIGNAL TO NOISE RATIO

**Stewart B. Blodgett, 6119 Jessamine St., Houston, Tex. 77081**

**Filed May 27, 1980, Ser. No. 153,591**

**Int. Cl.³ G01G *23/06, 3/14, 3/08***

**U.S. Cl. 177—187** **8 Claims**




1. A differential weighing system comprising a primary suspension including a weight supporting means, a secondary suspension having a natural frequency substantially matched to that of the primary suspension, first damping means for damping movement of the primary suspension relative to ground, second damping means for damping movement of the secondary suspension relative to ground, a third damping means for intercoupling the primary and secondary suspensions so as to provide damping of relative movement between the primary and secondary suspensions, and displacement responsive means, responsive to the relative displacement between the primary and secondary suspensions, for producing an output in accordance therewith.

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**4,298,082**

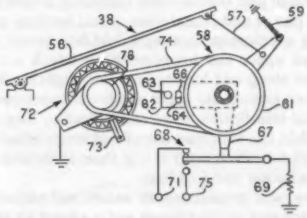
## ELECTRIC PROPULSION SYSTEM FOR WHEELED VEHICLES

**Joseph A. Ramos, 18 Hill St., San Francisco, Calif. 94110**

**Filed Jul. 21, 1978, Ser. No. 926,837**

**Int. Cl.³ B60K *17/08***

**U.S. Cl. 180—65 R** **6 Claims**




1. A propulsion system for a wheeled vehicle having an electric motor,

a variable speed power coupling unit connecting said motor to a drive shaft,

a generator connected to said shaft,

a battery connected by switching means to said motor and generator, and

control means including a movable accelerator pedal connected to a rheostat for controlling said variable speed power coupling unit and connected to operate a switch of said switching means having a first operating mode energizing said motor and a second operating mode energizing said generator, and means biasing said switch into said

second mode, with said pedal overcoming said biasing means upon depression to place said switch in said first mode and raising of said pedal a predetermined amount from any depressed position returns said switch to said second mode for disconnecting said battery from said motor and energizing said generator under conditions wherein said drive shaft is not being driven by said motor for minimizing the power required to drive said vehicle.

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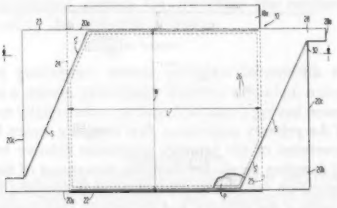
**4,298,083**

## FLEXIBLE FILM AIR PALLET FOR MATERIAL MOVEMENT

**Raynor A. Johnson, and Ralph M. Barrow, Jr., both of Newark, Del., assignors to American Industrial Research, Newark, Del.**

**Filed Jun. 13, 1979, Ser. No. 48,111**
**Int. Cl.[3] B60V *1/04***
**U.S. Cl. 180—125** **11 Claims**



1. An air pallet comprising:
a relatively rigid planar backing member for supporting a load,
said backing member including longitudinal and lateral side edges,
a bottom, thin flexible sheet underlying said backing member, bearing perforations and having longitudinal side edges,
means including at least said thin flexible sheet forming a plenum chamber for retaining pressurized air, thereby being formed between said bottom sheet and said backing member;
whereby, said air pallet is supported for frictionless movement ovver a supporting surface,
a portion of said bottom sheet extending laterally beyond at least one of said lateral sides of said backing member and being overlapped, forming a fold line therein with overlapped upper and lower portions which are sealed together along said longitudinal side edges thereof,
a seal line joining said upper and lower overlapped portions of said thin flexible sheet and extending diagonally from said fold line to at least one of said longitudinal side edges,
an air inlet means formed in said sheet at the end of said seal line adjacent said fold line;
whereby, said pressurized air enters said plenum chamber through said air inlet means and is guided by said seal line towards said backing member to prevent rupture of said overlapped thin flexible sheet portions.

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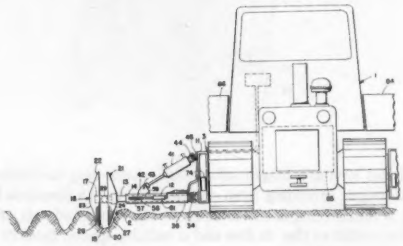
**4,298,084**

## GUIDANCE SYSTEM FOR TRACKLAYING TRACTORS

**Marvin H. Newell, 2056 Edgewood Dr., Lodi, Calif. 95240**

**Filed Apr. 10, 1980, Ser. No. 139,018**
**Int. Cl.[3] B62D *1/26, 15/02***
**U.S. Cl. 180—131** **10 Claims**

1. A guidance system for a track laying tractor for maintaining said tractor at a pre-selected distance from a previously formed ground furrow said tractor having a track roller frame, a rear sprocket, and front idler comprising:
(a) a rear mount frame attached to the rear outside portion of said track roller frame;
(b) a rear arm connected to said rear mount frame extending outwardly at substantially a right angle from said rear sprocket;
(c) a sight wheel mounted on said rear arm adapted for riding in said previously formed furrow at a selected fixed distance from said rear mount frame;
(d) a front frame attached to the front outside portion of said track roller frame;
(e) a front arm connected to said front mount frame extending outwardly from said tractor at substantially a right angle to said front idler;
(f) an extension arm slidably mounted coaxially on the distal end of said front arm;



(g) furrow following means mounted on the distal end of said extension arm adapted for staying within said previously formed furrow at said selected fixed distance;
(h) transmittal means mounted on said front arm for measuring, and transmitting the difference in distance of said furrow following means from said front mount frame as compared to said selected fixed distance of said rear sight wheel from said rear mount frame; and
(i) receiver means operatively connected to said transmittal means for indicating the relative distance of said furrow following means from said front mount frame, and said selected fixed distance of said sight wheel from said rear mount frame.

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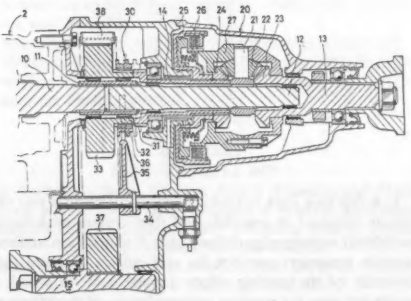
**4,298,085**

## AUTOMATIC FOUR-WHEEL DRIVE TRANSFER CASE

**Shuzo Moroto, Handa, and Koji Kobayashi, Toyota, both of Japan, assignors to Aisin-Warner K.K., Aichi, Japan**

**Filed Nov. 15, 1979, Ser. No. 94,598**
**Claims priority, application Japan, Nov. 24, 1978, 53-145857**
**Int. Cl.[3] B60K *17/34;* F16H *37/06, 1/44***
**U.S. Cl. 180—247** **7 Claims**



1. An automatic four-wheel drive transfer case for a vehicle, comprising:

(a) a differential gear drivingly connected to an output shaft of a transmission, said differential gear having first and second side gears and a casing;
(b) a rear-wheel drive output shaft drivingly connected to the first side gear;
(c) a clutch for releasably engaging the casing to the second side gear;
(d) a front-wheel drive output shaft;
(e) selective connection means for selectively connecting the front-wheel drive output shaft to the second side gear when four-wheel drive is selected; and
(f) clutch control means to engage and disengage the clutch in response to a signal indicating whether two-wheel or four-wheel drive has been selected and in response to signals representing the revolution speed of the rear-wheel and front-wheel drive output shafts.

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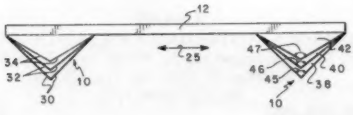
**4,298,086**

## COUPLING MEANS FOR HORIZONTAL VIBRATOR

**William C. Pritchett, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.**

**Filed Oct. 9, 1979, Ser. No. 83,070**
**Int. Cl.³ G01V *1/047***
**U.S. Cl. 181—113** **14 Claims**




1. In a transducer for inducing shear waves in an elastic medium including a horizontally movable support means adapted to couple the energy of said transducer into said medium, the improvement comprising a plurality of cleat means on said support structure for engaging the surface of said medium, said cleat means being of differing depth.

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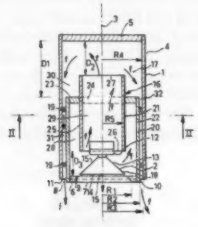
**4,298,087**

## UNIDIRECTIONAL SPEAKER ENCLOSURE

**Dominique Launay, 4 Ave. des Chardons, 94800 Villejuif, France**

**Filed Aug. 15, 1979, Ser. No. 66,539**
**Claims priority, application France, Aug. 16, 1978, 78 23848**
**Int. Cl.³ H05K *5/00***
**U.S. Cl. 181—153** **8 Claims**



1. A unidirectional speaker enclosure comprising a casing having a rigid cylindrical peripheral wall and a closed rear end, and having at its front end a central primary aperture and a single annular secondary aperture surrounding said primary aperture and adjacent a front end portion of said peripheral wall of the casing, an annular divider separating said secondary aperture from said primary aperture, a speaker mounted centrally in a forward portion of said casing and having a membrane facing said primary aperture, a rigid cylindrical outer partition extending rearwardly from said divider part way to the rear of said casing to define a chamber rearwardly of said speaker and an annular passage between said outer partition and said peripheral wall of said casing, said chamber having a rear wall with a central aperture, and a rigid cylindrical inner partition in said central aperture of said rear wall of said chamber and extending forwardly and rearwardly of said rear wall.

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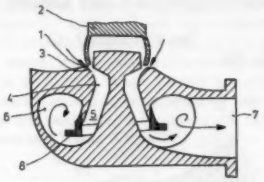
**4,298,088**

## DIFFUSER RESONANCES

**Jakob Keller, Fislisbach, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland**

**Filed Jun. 8, 1979, Ser. No. 46,939**
**Claims priority, application Switzerland, Jun. 8, 1978, 6272/78**
**Int. Cl.³ F01N *1/00***
**U.S. Cl. 181—211** **9 Claims**




1. A diffuser structure comprising:
a flow path having an inlet and an outlet, the inlet having a cross-sectional flow area which is less than the cross-sectional flow area of the outlet;
a flow-driven resonance positioned immediately upstream of the flow path inlet;
means for modifying the acoustic impedance of the flow path, positioned at the flow path outlet but upstream thereof, including an abrupt change in the cross-sectional flow area of the flow path, and operable to suppress the flow-driven resonance.

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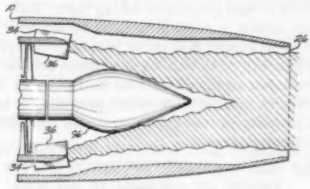
**4,298,089**

## VORTEX GENERATORS FOR INTERNAL MIXING IN A TURBOFAN ENGINE

**Stanley F. Birch, Bellevue; John A. Lawler, Federal Way, and Gerald C. Paynter, Seattle, all of Wash., assignors to The Boeing Company, Seattle, Wash.**

**Division of Ser. No. 754,046, Dec. 23, 1976, Pat. No. 4,175,640, which is a continuation-in-part of Ser. No. 563,548, Mar. 31, 1975, abandoned. This application Jun. 28, 1979, Ser. No. 53,126**
**Int. Cl.³ F02K *1/46***
**U.S. Cl. 181—213** **3 Claims**



1. In a turbofan engine having an annular fan fluid flow exhaust passageway located between an outer engine cowling and a splitter wall structure, and an annular primary fluid flow exhaust passageway located inside of said splitter wall structure, apparatus for internal mixing of fan exhaust with primary exhaust forward of the nozzle exit plane of said engine comprising:
a vortex generator attached to said splitter wall structure at

least one nozzle diameter forward of said nozzle exit plane and extending radially into one of said annular passageways a distance of at least 30% of the width of the passageway, and mounted to have an angle of attack with respect to the local flow direction ranging from 5° to 25°; and

means for blocking the hot primary exhaust flow core and diverting it so that it mixes with said fan air within the engine forward of said nozzle exit plane and downstream of said vortex generator.

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**4,298,090**

## MULTI-LAYER ACOUSTIC LININGS

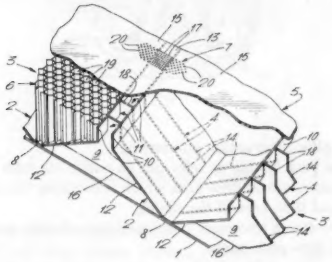
**John F. Chapman, Solihull, England, assignor to Rolls-Royce Limited, London, England**

**Filed Nov. 6, 1979, Ser. No. 92,089**

**Claims priority, application United Kingdom, Dec. 27, 1978, 50046/78**

**Int. Cl.³ E04B** *1/82*

**U.S. Cl. 181—286** **10 Claims**



**1.** A multi-layer acoustic lining for a fluid flow duct comprising:

an impermeable backing layer;

a sound permeable facing layer spaced from said impermeable backing layer;

a plurality of Helmholtz resonators sandwiched between said backing layer and said sound permeable facing layer, said plurality of Helmholtz resonators being defined by a first set of resonator compartments, each of which is acoustically coupled to said sound permeable facing layer by a resonator neck means having a cross-sectional area restrictive relative to the cross-sectional area of the resonator compartments of the Helmholtz resonators;

a plurality of tube-type resonators sandwiched between said backing layer and said facing layer, said plurality of tube-type resonators being defined by a second set of resonator compartments, each of which is acoustically coupled directly to said permeable facing layer; and

partition means providing an acoustic division between at least some of said first set of resonator compartments for said plurality of Helmholtz resonators and said second set of resonator compartments for said plurality of tube-type resonators, said partition means providing at least some of said plurality of tube-type resonators with different resonant frequencies.

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**4,298,091**

## SELF ADJUSTABLE HARNESS OR SLING

**Jeffrey J. Anderson, P.O. Box 11, Pottersville, N.J. 07979**

**Filed Jun. 5, 1980, Ser. No. 156,748**

**Int. Cl.³ A62B** *35/00*

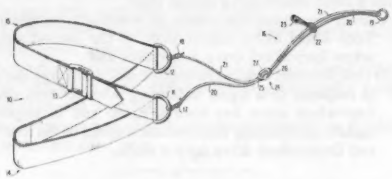
**U.S. Cl. 182—3** **9 Claims**

**1.** In a self-adjustable harness for use alternatively as a sling to support a human body or when attached to the shoulders to exert a force on a load, the combination including:

a closed loop of webbing;

a pair of independent rings through which said webbing is loosely slidable;

elongated rope means having one end provided with selectable detachable connector means for attachment to a support or to a load;



the other end of the rope means having two diverging portions, each being connected to a respective one of said rings, and;

adjustable buckle means for adjusting the lengths of said diverging portions, whereby the rings may subdivide the webbing into two portions each of which partially encircles the same side of a body member when in use.

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**4,298,092**

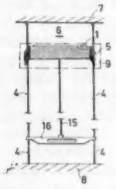
## DEVICE AT UNFOLDABLE ESCAPE-LADDER

**Lars O. Eriksson, Sigyns väg 5c, 149 00 Nynäshamn, Sweden**

**Filed Mar. 11, 1980, Ser. No. 129,349**

**Int. Cl.³ E06C** *1/56*

**U.S. Cl. 182—70** **5 Claims**



**1.** A device comprising an unfoldable escape-ladder, which is assembled of rungs **(1)**, the ends **(3)** of which are attached between flexible lateral members **(5)**, preferably steel wires, which rungs **(1)** are longish and made of plate-shaped material and can be stacked side against side, and the upper portion of the escape-ladder is intended to be attached to a wall **(6)**, a stay or **(1)** lying stacked and forming with each of the steel wires **(5)** a ring for each rung, and which escape-ladder is provided with a means for releasing the ladder, characterized in that two steel wires **(4)** or rods are provided, which are located in parallel and rigidly attached along the direction, which the ladder in unfolded state is desired to assume, and that said steel wires **(4)** or rods extend through the rings formed by the firstmentioned steel wires **(5)**.

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**4,298,093**

## SAWHORSE

**Harold R. Wing, Springville, Utah, assignor to Little Giant Industries, Inc., Provo, Utah**

**Filed Nov. 16, 1978, Ser. No. 961,341**

**Int. Cl.³ E04G** *1/32;* **F16M** *11/00*

**U.S. Cl. 182—153** **12 Claims**

**1.** A sawhorse comprising in combination:

a first pair of side rails;

a second pair of side rails hingedly connected to one end of said first pair of side rails to accommodate folding and unfolding of said sawhorse from a folded configuration wherein said side rail pairs are in a side by side position, to an upright configuration and vice versa;

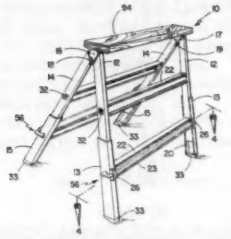
means for locking said first and second side rail pairs in one of said folded or upright configurations;

a third pair of side rails slidably mounted on said first pair of side rails to accommodate vertical extension thereof;

a fourth pair of side rails slidably mounted on said second pair of side rails to accommodate vertical extension thereof;

at least one step mounted between said first side rail pair and at least one step mounted between said third side rail pair;

first means connected to the step mounted between said third side rail pair for locking said third pair of side rails in one or more vertically extended positions relative to said



first side rail pair, said first locking means comprising means adapted to be locked into holes formed in the sides of said first side rail pair, said holes being positioned such that the steps mounted between said third side rail pair may be locked into alignment with the steps mounted between said first side rail pair;

second means connected to the step mounted between said fourth side rail pair for locking said fourth pair of side rails in one or more vertically extended positions relative to said second side rail pair; and

a work platform removably mounted atop said first and second side rail pairs.

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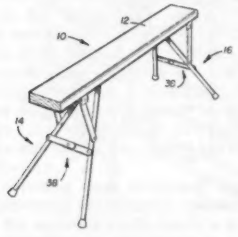
**4,298,094**

## COLLAPSIBLE SAWHORSE

**Munro L. Strong, San Fernando Way, San Francisco, Calif. 94127**

**Filed Sep. 10, 1980, Ser. No. 185,754**
**Int. Cl.³ F16M *11/00***
**U.S. Cl. 182—155** **6 Claims**



**1.** A collapsible sawhorse including a beam member and a pair of leg assemblies adapted to support the beam and sawhorse and to be collapsible to a stored position adjacent a surface of said beam, the improvement comprising:

a pair of frame members mounted to the undersurface of said beam member one near each end thereof,

each frame including a generally central rib member at one end thereof and aligned with the longitudinal axis of said beam, a cutout portion in said rib defining a locking hole, a pair of ears at the opposite end of said frame, said opposite end of said frame being adjacent to an end of said beam,

a pair of braces pivotally mounted at one end to each of said frames at said ears, one brace being mounted to each ear of each frame,

leg members pivotally mounted at a position intermediate the length thereof to the other end of each of said braces so as to establish a pair of legs supported on said frames at each end of said beam,

a doglike structure at one end of each of said legs, said doglike structure being adapted to be positionable within said locking hole in said rib of said frame, said locking hole accommodating said doglike structure from a pair of said legs at each end of said beam,

a collapsible cross member pivotally mounted to said leg members at a position intermediate the length thereof and in the vacinity of said pivotal mounting of said leg members to said braces, said cross member including a self-locking means for spreading said leg members and maintaining said doglike structures within said locking holes,

said frames, braces, leg members and cross members being so mounted to each other at said pivotal mountings to form said leg assemblies and to permit said leg assemblies to be collapsible and positioned adjacent to the surface of said beam where said frame is attached.

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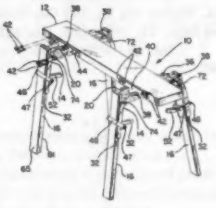
**4,298,095**

## WORK SUPPORT FRAME

**Ronald A. Jackson, Brockville, and John Maruscak, Athens, both of Canada, assignors to Black & Decker Inc., Newark, Del.**

**Continuation-in-part of Ser. No. 10,210, Feb. 8, 1979. This application Jan. 17, 1980, Ser. No. 108,449**
**Int. Cl.³ F16M *11/00*; E04G *1/32***
**U.S. Cl. 182—184** **10 Claims**



**1.** In a work support, the improvement which comprises:

(a) a unitary channel member having a top portion to support one end of a plank and further having integral bent leg portions at respective ends thereof,

(b) clamp means on the leg portions for receiving and retaining support legs thereon, and

(c) at least one bracing member carried on the channel member to support the leg in a direction of force opposite that exerted thereon by the clamp means.

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**4,298,096**

## CONVERTIBLE TRESTLE LEG ASSEMBLY

**Herbert E. Prior, P.O. Box 798, Sebastopol, Calif. 95472**

**Filed Sep. 15, 1980, Ser. No. 187,562**
**Int. Cl.³ F16M *11/00***
**U.S. Cl. 182—186** **4 Claims**

**1.** In a trestle leg assembly comprising:

a pair of legs of steel shapes pivoted together at their upper ends, and means including toggle links interconnecting said legs for separating the lower ends of said legs and locking them in separated position;

the improvement comprising:

base plates secured to the upper ends of said legs;

a pair of angle members; and

complementary bolt holes in a horizontal leg of each of said angle members and in each of said base plates;

bolt means for releasably securing one of said angle members to each of said base plates;

said bolt holes being so positioned that when the vertical legs of said angle members are disposed in inboard, back to back positions the space between them is substantially equal to the standard thickness of a length of lumber and when disposed in outboard, face to face positions they will be spaced apart by substantially the width of said lumber.

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**4,298,097**

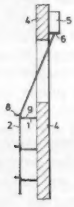
**ESCAPE-LADDER**

**Lars O. Eriksson, Sigyns väg 5c, 149 00, Nynäshamn, Sweden**

**Filed Mar. 11, 1980, Ser. No. 129,348**

**Int. Cl.³ E06C *1/56***

**U.S. Cl. 182—198** **4 Claims**



**1**. An escape-ladder assembled of rungs **(1)**, the ends **(3)** of which are attached between flexible lateral members **(2)**, preferably steel wires, which rungs **(1)** are longish and of plate-shaped material and can be stacked side against side, the upper portion of the escape-ladder intended to be attached to a wall **(4)**, a stay or the like, which escape-ladder in folded state has its rungs **(1)** lying stacked and each of the steel wires **(2)** forming a ring for each rung **(1)**, characterized in that each rung **(1)** has substantially S-shaped cross-section, where the free ends of the S-shaped portion **(7)** are extended so as to form parallel upper and lower legs **(8,9)**, and that the steel wires **(2)** are attached on the rungs **(1)** with their substantial longitudinal direction perpendicularly to said legs, so that in unfolded state of the ladder the upper one **(8)** of said legs constitutes a tread and the lower one **(9)** constitutes a distance member for maintaining the ladder at a certain distance from a wall **(4)** or the like, along which the ladder is unfolded.

**4,298,098**

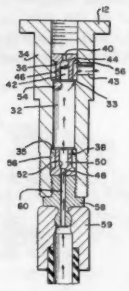
**LUBE PLUG**

**Leo Stella, Bristol, Conn., assignor to The Torrington Company, Torrington, Conn.**

**Filed Oct. 25, 1979, Ser. No. 87,949**

**Int. Cl.³ F01M *11/00***

**U.S. Cl. 184—105 B** **5 Claims**



**1**. In a cam follower containing lubricant: an inner member; an outer member of greater inside diameter than the outside diameter of the inner member thus providing an annular space between the inner member and the outer member; a plurality of rolling members in the annular space, said inner member having a longitudinal lubrication bore and a cross-hole extending radially from the longitudinal lubrication bore to the annular space; and plug means in the longitudinal bore located to seal the lubricant; said plug means including a plug having enough stiffness to normally remain in its original position but resilient enough to be moved from its original position by the application of lubricant pressure.

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**4,298,099**

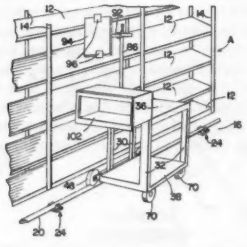
**MERCHANDISE ORDER PICKING SYSTEM AND WORK TABLE**

**Harold Isaacs, 2567 Lafayette Dr., University Heights, Ohio 44118**

**Filed May 12, 1978, Ser. No. 905,429**

**Int. Cl.³ B61D *15/00***

**U.S. Cl. 186—58** **7 Claims**



**4**. A mobile work table for an order picking system or the like, said table having opposite inboard and outboard sides and opposite ends;

(a) vertically-spaced upper and lower substantially horizontal rectangular panels each having an outer periphery and inboard and outboard corners;

(b) a pair of outboard upright frame members extending between said panels adjacent said outboard corners thereof and being welded thereto against said outer periphery of each said panel;

(c) a pair of inboard upright frame members extending be-

tween said upper and lower panels adjacent said inboard corners thereof and being welded thereto against said outer periphery of each said panel;

(d) said inboard upright frame members being welded to said panels on said inboard side of said work table and being spaced substantially inwardly from said inboard corners;

(e) an elongated substantially horizontal frame member secured to said inboard upright frame members against the surfaces thereof facing outwardly of said inboard side of said work table;

(f) a pair of outboard wheels secured to the underside of said lower panel adjacent said outboard side of said work table for rotation about outboard wheel axes extending parallel tc said work table ends;

(g) a pair of spaced-apart inboard wheels secured to said horizontal frame member adjacent the opposite ends thereof for rotation on inboard wheel axes extending parallel to said outboard wheel axes;

(h) said inboard wheel axes being spaced above said outboard wheel axes; and

(i) said inboard wheels having circumferential track receiving grooves therein of generally arcuate cross-sectional shape.

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**4,298,100**

## SWITCHING APPARATUS FOR A GROUP OF ELEVATORS OR THE LIKE

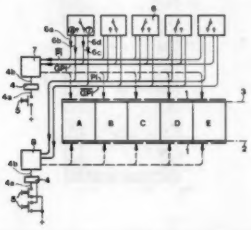
**Hans G. Süss, Udligenswil, and Jiri Kiml, Ebikon, both of Switzerland, assignors to Inventio AG, Hergiswil, Switzerland**

**Filed Nov. 23, 1979, Ser. No. 96,982**

**Claims priority, application Switzerland, Dec. 12, 1978, 12630/78**

**Int. Cl.³ B66B 1/20**

**U.S. Cl. 187—29 R** **8 Claims**




1. In a switching apparatus for a group of elevators containing devices for the control mode collective control and the control mode individual travel control and having automatic elevator cabin doors and wherein there are provided storey call storages controllable by means of storey call transmitters which are correlated to each control mode, comprising:

said control mode collective control being operatively correlated to a first access side of the elevators and the control mode individual travel control to a second access side of the elevators;

said first switching stage producing two non-equivalent signals preventing the allocation of the storey calls correlated to the operating mode which is to be turned-off to the elevator which is to be switched;

said first switching stage containing an input side and an output side;

a second switching stage having an input side connected with the output side of the first switching stage;

said second switching stage comprising logic circuitry for processing the non-equivalent signals;

means for infeeding input information to the second switching stage which signals one of the operating modes of the elevator cabin;

said second switching stage having an output;

a third switching stage having an input side connected with the output of the second switching stage;

said third switching stage having infed thereto a first output signal produced upon switching in the second switching stage;

said second switching stage producing a second output signal and third output signal which by freeing a related door control of the elevator causes allocation of the elevator to the selected operating mode when said infeeding means infeeds input information signaling the operating mode "free" of the elevator to be switched;

said third switching stage having an output side and containing a timing element which after expiration of a predetermined control time, prior to allocation of the elevator to the other operating mode, produces a signal interrupting the cabin call transmitter supply; and

a fourth switching stage connected with the output side of the third switching stage for producing further signals, by means of which, after servicing the last cabin call located in the momentary direction of travel of the elevator cabin, extinguishes the still stored cabin calls and blocks the door closing operation until emptying of the elevator cabin.

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**4,298,101**

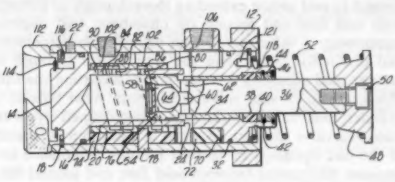
## SHOCK ABSORBER

**Richard G. Dressell, Jr., Livonia, and Robert J. Heideman, Westland, both of Mich., assignors to Enertrols, Inc., Livonia, Mich.**

**Filed Oct. 5, 1979, Ser. No. 82,190**

**Int. Cl.³ F16F 9/44**

**U.S. Cl. 188—285** **7 Claims**



1. A device for applying a force to a moving member so as to decelerate the member, comprising:

a tubular cylinder having a plurality of ports formed through its wall which are spaced relative to one another along the longitudinal axis of the cylinder;

a piston slidable within the cylinder and means for mounting said cylinder and said piston with respect to said moving member to cause said piston to slide in said cylinder by movement of said member;

a sleeve having an interior wall surrounding the cylinder and having a number of holes formed in it equal to the number of ports formed through the cylinder and spaced relative to one another longitudinally along the length of the sleeve at the same spacing as the port in the cylinder, and further having a plurality of corresponding grooves formed in the interior wall of the sleeve, each groove being in substantial alignment with one of the holes in the sleeve, each groove being of substantially constant cross sectional configuration and having a cross sectional area greater than the area of said cylinder ports;

each of said grooves extending transversely to the radial planes of said sleeve, said sleeve disposed over said cylinder and said sleeve and grooves located so that each groove overlies a respective one of said cylinder ports to a varying degree as said sleeve and cylinder relative angular position is shifted by relative rotation therebetween;

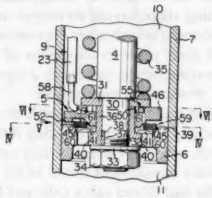
a volume exterior to said sleeve, the holes in said sleeve providing fluid communication with said groove and the exterior volume.

**4,298,102**

## SHOCK ABSORBER FOR VEHICLE USE

**Masao Nishikawa, Tokyo, and Hitoshi Yamamoto, Asaka, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 877,851, Feb. 15, 1978, abandoned. This application Nov. 6, 1979, Ser. No. 91,766**
**Claims priority, application Japan, Mar. 22, 1977, 52-31333**
**Int. Cl.³ F16F *9/44***
**U.S. Cl. 188—319** **7 Claims**



1. An improved shock absorber for vehicle use of the type having in combination, a cylinder filled with hydraulic oil and a piston slidably fitted therein, being formed with a piston rod, and arranged between members of a vehicle suspension system, respectively associated with the body of the vehicle and a wheel assembly thereof, said cylinder having a head portion supported on one of said members and a free end portion of said piston rod supported on the other of said members, to thereby moderate the force of impact due to relative movement between said members, first and second oil chambers defined in said cylinder by said piston; at least one oil passage formed in said piston extending therethrough to communicate with said first and second oil chambers; said improvement comprising: a valve mechanism provided in association with said piston for controlling the flow of oil through said oil passage; and adjusting mechanism for adjusting the operating characteristic of said valve mechanism from outside of said cylinder; said valve mechanism being defined by: a resilient plate-like valve element arranged in a position adjacent to one of the end openings of said oil passage responsive to an oil pressure differential between said first and second oil chambers; valve-element support means movable in response to deflection of said valve element for holding the latter in a closed position as long as the amount of deflection of said valve element is not greater than a preset value and adapted to be held against any further movement, said valve element being adapted to assume an open state with clearance defined between said valve-element support means and at least part of the peripheral region of said valve element in **(59,59', 104)** correspondence with the amount of deflection of said valve element when the amount of deflection of said valve element exceeds said present valve, orifice means for allowing a preset flow of oil through said oil passage when said valve element is in a closed position; and control means adapted to selectively limit the extent of movement of said valve-element support means by said adjusting mechanism; said valve element is further defined as an annular valve member formed of resilient sheet material and arranged coaxially with said piston, in which said valve-element support means is defined by a first annular valve-seat member for supporting the outer peripheral edge portion of said valve element on one face thereof and a second annular valve-seat member for supporting the inner peripheral edge portion of said valve element on the other face thereof; one of said valve-seal members has controlling surfaces arranged thereon along a circle concentric with and of a different radius from the annular valve seat thereof, said controlling surfaces respectively increasing successively in height at a fixed rate in a circumferential direction of the valve-seat member while the other valve-seat member has feet means formed thereon along a circle concentric with and different in radius from the annular valve seat thereof, in positions corresponding to said controlling surfaces which are of the same height, including one in each of said controlling surfaces, said feet means extending the same direction from said other valve-seat member toward said controlling surfaces and in which said one valve-seat member is arranged for rotation about the axis of said valve-element support means, the axial distance of said feet from said controlling surfaces is varied uniformly when said one valve-seat member is rotated relative to the other valve-seat member by said adjusting mechanism and an adjusting-torque transmitting spring is provided which is held in integral engagement with said second annular valve-seat member, including at least one projecting portion and one engaging portion engageable with a driver element of said adjusting mechanism, said projecting portion being formed so as to resiliently fall into a selected one of a plurality of recesses formed in the outer peripheral surface of said piston rod or of a member restrained thereon, so as to be rotatable relative thereto in positions circumferentially adjacent to each other, as said second valve-seat member is rotated relative to said first valve-seat member by operation of said adjusting mechanism.

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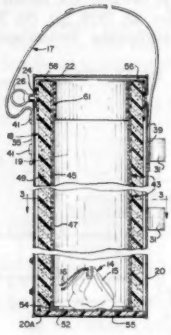
**4,298,103**

## COMBINATION PORTABLE STORAGE CONTAINER AND HEAD REST

**Donald De Fries, 5223 North Oakview, Chicago, Ill. 60656**

**Continuation-in-part of Ser. No. 937,894, Aug. 29, 1978, Pat. No. 4,222,468. This application Apr. 14, 1980, Ser. No. 139,904**
**Int. Cl.³ A45C *3/10***
**U.S. Cl. 190—42** **9 Claims**



1. In a combination portable storage container and head rest, a hollow elongated rigid tubular member, an elongated outer resilient tubular member axially aligned with and surrounding said inner rigid member, an elongated covering enclosing said outer resilient member, said covering having openable means for permitting access to the interior of said hollow elongated rigid tubular member, the combination comprising: said rigid member having an opened top cylindrical body portion, said body portion having a rigid bottom wall, said cylindrical body portion being composed of paper stock material, said rigid member including a rigid collar surrounding the opened-top end of said body portion.

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**4,298,104**

## LUGGAGE HANDLE HAVING RELEASABLE LOCKING ASSEMBLY

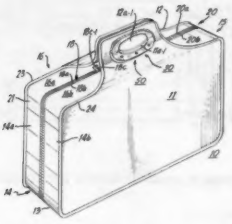
**Henry Leong, 6 Waller Ct., Kendall Park, N.J. 08824**

**Filed Dec. 17, 1979, Ser. No. 104,356**
**Int. Cl.³ A45C *13/26***
**U.S. Cl. 190—48** **15 Claims**

1. Portable carrying means comprising a carrying portion having a pair of supple flaps integral with said carrying portion, each flap having an opening;
a handle assembly comprising first and second handle subassemblies each being integrally joined to one of said flaps;

each handle sub-assembly having an opening aligned with the opening in the associated flap;

said first and second sub-assemblies including first and second locking means respectively for releasably locking said first and second sub-assemblies to one another;



said first locking means comprising a guidance opening having a locking recess; and

said second locking means comprising an alignment projection for insertion into said guidance opening and a locking projection for releasable engagement with said locking recess.

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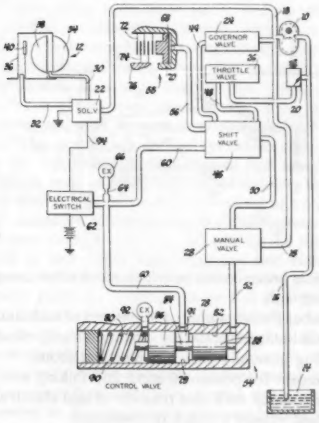
**4,298,105**

## CONTROL VALVE MECHANISM FOR A POWER TRANSMISSION

**Michael L. Duhaime, Detroit, Mich., assignor to General Motors Corporation, Detroit, Mich.**

**Filed Nov. 16, 1979, Ser. No. 94,692**
**Int. Cl.³ B60K *41/24***
**U.S. Cl. 192—3.23** **4 Claims**




1. A control valve for use in a power transmission having a pair of friction drive establishing means, one of which drive establishing means is controlled by an electrically-operated solenoid valve and the other of which drive establishing means is controlled by a hydraulically-operated shift valve, said control valve comprising; a stepped valve bore, a differential area spool valve slidably disposed in the stepped valve bore and a passage means interconnecting the hydraulic shift valve and the differential area of said valve spool, a restricted exhaust being interconnected with said passage means; and electrical switch means connected in said passage means upstream of said restricted exhaust and being pressure-activated to assume an actuated position to control the solenoid valve to disengage said one drive establishing means, said passage means being operable to provide a controlled pressure outlet in cooperation with said valve spool and said restricted exhaust for said other drive establishing means such that on disengagement of said other drive establishing means the pressure within said passage means is initially increased sufficiently to actuate said switch means and after a predetermined time the pressure therein is reduced through said restricted exhaust to permit said switch means to return to its unactuated condition.

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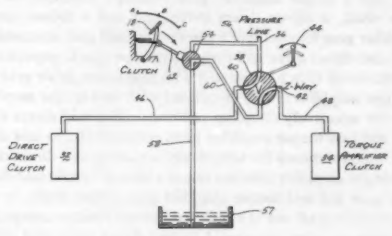
**4,298,106**

## METHOD AND APPARATUS FOR BRAKING TORQUE AMPLIFIER

**Jerry D. Elijah, 209-8th Street, Tipton, Iowa 52772**

**Filed Feb. 22, 1979, Ser. No. 14,046**
**Int. Cl.³ B60K *41/22***
**U.S. Cl. 192—3.57** **2 Claims**




1. A braking device for a torque amplifier comprising: an engine;

a first drive shaft;

an engine clutch for alternatively connecting and disconnecting said engine to said first drive shaft;

a direct drive gear rotatably mounted on said first drive shaft;

a direct drive clutch associated with said direct drive gear for selectively coupling and uncoupling said direct drive gear to said first drive shaft;

a torque amplifier gear rotatably mounted on said first drive shaft;

a torque amplifier clutch associated with said torque amplifier gear for selectively coupling and uncoupling said torque amplifier gear to said first drive shaft;

a first transmission shaft having a driven direct drive gear and a driven torque amplifier gear fixed thereto in meshing engagement with said direct and torque amplifier gears, respectively,

torque amplifier control means connected to said torque amplifier clutch and said direct drive clutch for controlling the coupling and uncoupling thereof to said first drive shaft;

said torque amplifier control means comprising a torque amplifier valve connected to a source of hydraulic pressure, first and second conduits connecting said torque amplifier valve to said torque amplifier clutch and said direct drive clutch respectively, a brake control valve, a third conduit interconnecting said torque amplifier valve and said brake control valve and a fourth conduit interconnecting said brake control valve and said source of hydraulic pressure;

said torque amplifier valve being movable to a first position connecting one of said first and second conduits to said source of hydraulic pressure and the other of said first and second conduits to said brake control valve, through said third conduit;

said torque amplifier valve being further movable to a second position connecting said other of said first and second conduits to said source of hydraulic pressure and said one of said first and second conduits to said brake control valve through said third conduit, and

said brake control valve being movable from a closed posi-

tion closing off said source of hydraulic pressure from said fourth conduit to said third conduit to an open position connecting said source of hydraulic pressure from said fourth conduit to said third conduit only when said engine clutch has disengaged said engine from said direct drive shaft;

whereby said torque amplifier clutch and said direct drive clutches are both actuated when said brake control valve is in said open position, thereby causing said direct drive gear and said torque amplifier gears both to be fixed to said first drive shaft, the resulting difference in gear ratios of said direct drive and torque amplifier gears causing said direct drive and said transmission shafts to stop rotating.

2. An improved braking device for a torque amplifier comprising a drive shaft and a transmission shaft, a direct drive gear and a torque amplifier gear rotatably mounted on said drive shaft, a driven direct drive gear and a driven torque amplifier gear fixed to said transmission shaft and intermeshing with said direct drive and torque amplifier gears, respectively; a direct drive clutch associated with said direct drive gear and a torque amplifier clutch associated with said torque amplifier gear for selectively coupling and uncoupling said direct drive gear and said torque amplifier gear, respectively, to said drive shaft; control means for selectively actuating said direct drive and torque amplifier clutches one at a time to couple said direct drive gear and said torque amplifier gear, respectively, to said transmission shaft one at a time; said control means comprising hydraulic circuitry connected to said direct drive and torque amplifier clutches and a first valve movable from a first position directing pressurized hydraulic fluid to only said direct drive clutch to a second position directing hydraulic fluid only to said torque amplifier clutch;

said improved braking device comprising:

a brake control valve connected to said source of hydraulic pressure;

hydraulic connecting means interconnecting said brake control valve and said first valve;

said first valve interconnecting said connecting means to said torque amplifier clutch when said first valve is in said first position and connecting said connecting means to said direct drive clutch when said first valve is in said second position;

said brake control valve being selectively movable from a first position connecting said pressure source to said connecting means to a second position disconnecting said pressure source from said connecting means whereby both of said torque amplifier and direct drive clutches will be actuated whenever said brake control valve is in said first position, independently of whether said first valve is in its said first or second positions.

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**4,298,107**

## BRAKE SYSTEM FOR A TEXTILE MACHINE

**Gerd Schmitz, Sulz/Attikon, and Otto Hintsch, Wallisellen, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland**

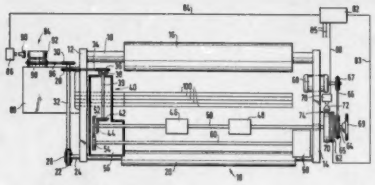
**Filed Dec. 3, 1979, Ser. No. 99,476**

**Claims priority, application Switzerland, Dec. 6, 1978, 12476/78**

**Int. Cl.**[3] **F16D** *67/02, 71/00, 65/36*

**U.S. Cl. 192—12 D** **26 Claims**

1. In combination with a textile machine having a plurality of individual operating components and a main drive for actuating and driving each said component; a brake system including at least two brake elements, each said brake element being selectively connected to a respective component to effect braking thereof and each brake element having a different braking characteristic relative to the other of said brake elements, and a common control means for actuating said brake elements.



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**4,298,108**

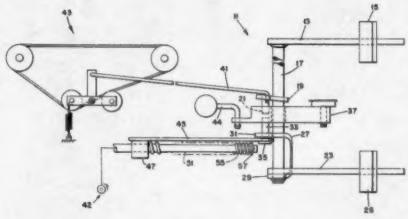
## BRAKE-CLUTCH INTERLOCK

**Wayne R. Hutchison, Mayville, Wis., assignor to Deere & Company, Moline, Ill.**

**Filed Oct. 9, 1979, Ser. No. 83,040**

**Int. Cl.**[3] **F16D** *67/02;* **B60K** *41/24*

**U.S. Cl. 192—13 R** **4 Claims**



1. A vehicle brake-clutch interlock mechanism comprising;

(a) a clutch arm;

(b) a crossbar fixably mounted to one end of said clutch arm;

(c) a clutch linking arm fixably mounted to said crossbar and extending generally perpendicular therefrom;

(d) first means for communicating said linking arm to said vehicle's clutch such that rotation of said clutch arm will cause said vehicle's clutch to disengage;

(e) first locking pin fixably mounted to said clutch linking arm and extending generally perpendicular therefrom;

(f) a brake arm rotatably mounted to said crossbar;

(g) a brake linking member fixably mounted to said brake arm and rotatable with said brake arm with respect to said crossbar;

(h) second locking pin fixably mounted to said brake linking member;

(i) second means for communicating said linking member to said vehicle brake such that rotation of said brake arm causes engagement of said vehicle's brakes;

(j) interlocking means for restrainable engagement of said first and second locking pins such that said vehicle's brake is engaged and said vehicle's clutch assembly is disengaged, said interlocking means cannot singularly engage or disengage said first and second locking pins.

## 4,298,109
## CONTROL SYSTEM FOR AN AUTOMATIC VEHICLE TRANSMISSION

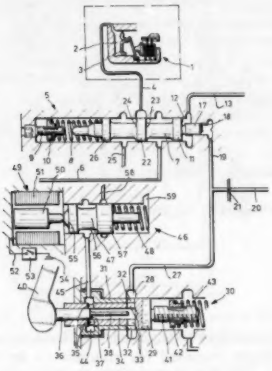
**Heinz Dörpmund, Wolfsburg, and Gerd Oberpichler, Braunschweig, both of Fed. Rep. of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany**

**Filed Jul. 26, 1979, Ser. No. 60,876**

**Claims priority, application Fed. Rep. of Germany, Oct. 6, 1978, 2843615**

**Int. Cl.³ F16D *67/00***

**U.S. Cl. 192—0.044** **9 Claims**



**1.** In an automatic transmission for a motor vehicle, having an accelerator pedal and a brake pedal, said transmission having hydraulically actuatable gear shift elements, a gear select lever having a plurality of selectable forward drive positions, including automatic forward drive (D), a source of first pressurized hydraulic fluid, and a manual control valve, responsive to the position of said select lever, for supplying said first fluid to a selected gear shift element when said lever is in one of said forward drive positions, a control system for selectively interrupting the supply of said first fluid to said selected element comprising a main control valve for controlling the supply of said first fluid from said manual control valve to said selected element, means for providing a second fluid pressure for acting on said main control valve for connecting the supply of said first fluid to said element for engaging said element, and a purging control valve means responsive to the position of said accelerator pedal for venting the second fluid pressure supplied to said main control valve when the accelerator pedal is released, to discontinue said first fluid supply and exhaust the fluid from said element to disengage said element, the improvement comprising means responsive to the position of said brake pedal for controlling said main control valve for permitting said element to disengage only when said brake pedal is depressed.

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## 4,298,110
## TWO-SPEED CLUTCH WITH NEUTRAL

**John W. Toma, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.**

**Filed Jan. 7, 1980, Ser. No. 110,170**

**Int. Cl.³ F16D *43/18, 43/30, 21/08***

**U.S. Cl. 192—48.4** **16 Claims**

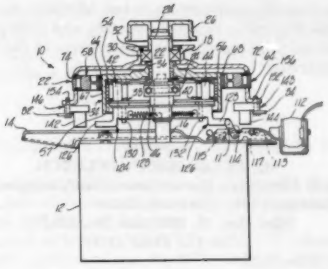
**1.** A two-speed clutching arrangement producing a driving connection between a rotary input means and a rotary output means in a plurality of drive modes, including a first mode in which said rotary output means is driven at the same rotative speed as said rotary input means; a second mode in which said rotary output means is driven by said rotary input means at a reduced speed, said clutching arrangement comprising:

a rotatably supported inner drum;

means producing a driving connection between said rotary input means and said inner drum;

an outer drum mounted over said inner drum, said outer drum comprising said rotary output means;

slip clutch means interconnecting said inner drum and said outer drum, said slip clutch means including means establishing a driving connection between said inner drum and said outer drum producing a lesser rate of rotation of said outer drum than said inner drum to thereby produce said reduced drive between said rotary input means and said outer drum;



direct drive clutch means interconnecting said inner drum and said outer drum, said direct drive clutch means including at least one clutch shoe and means mounting said at least one clutch shoe to one of either said inner drum or outer drum at one end thereof to be centrifugally moved by rotation of said one of said inner drum or outer drum to produce a driving engagement with the other of said inner drum or outer drum, whereby centrifugal engagement of said at least one clutch shoe produces a direct drive connection between said inner drum and said outer drum.

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## 4,298,111
## VISCOUS FLUID COUPLING DEVICE

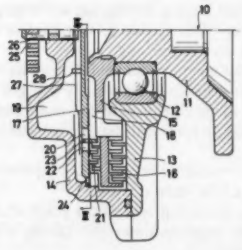
**Masaharu Hayashi, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan**

**Filed Nov. 7, 1979, Ser. No. 91,921**

**Claims priority, application Japan, Nov. 16, 1978, 53/141809**

**Int. Cl.³ F16D *35/00, 43/25***

**U.S. Cl. 192—58 B** **5 Claims**



**1.** A viscous fluid coupling device, comprising:

an input member driven by a vehicle engine and having a rotor thereon,

an output member rotatably supported on said input member,

a partition plate member dividing the interior of said device into an operating chamber for accommodating said rotor and a reservoir chamber for the viscous fluid,

labyrinth means between said input member and said output member,

aperture means in said rotor radially inwardly of said labyrinth means to provide fluid communication between opposite sides of said rotor,

first passage means for sending the viscous fluid from said operating chamber to said reservoir chamber,

second and third passage means formed on said partition plate member for communicating said viscous fluid from said reservoir chamber to said operating chamber,

a partition wall integrally formed with said partition plate member at the radially inner end of said labyrinth means for directing the flow of fluid passing through said first and second passage means to said labyrinth means, and

thermal responsive means for opening and closing said second and third passage means responsive to the change of temperature.

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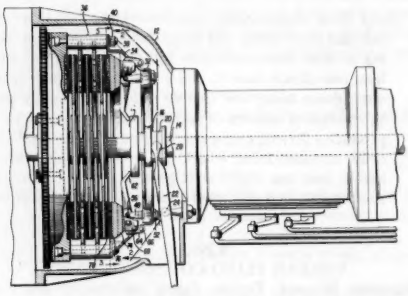
## 4,298,112
## SIX LEVER RACING CLUTCH

**Franklin E. Carstensen, Garden Grove, Calif., assignor to American Industries Inc., Cleveland, Ohio**

**Filed Dec. 19, 1979, Ser. No. 105,316**
**Int. Cl.³ F16D *13/44***
**U.S. Cl. 192—70.29** **12 Claims**



1. In a clutch having

a plurality of lever arms in a circular array, each pivoting about a yoke pivot pin which is maintained in a yoke holding element that extends about each side of the lever arm, and

a pressure plate forging driving lug also engaging each lever arm, the improvement comprising using as the lever arm a long lever arm comprising

a generally flat main longitudinal element having a top beam surface that extends in a generally straight line parallel to the longitudinal direction of the main element with one end defining an inner end and the opposite end defining an outer end;

an upwardly extending release bearing point element at the inner end of the main element;

an upwardly extending centrifugal point of adjustment element at the opposite outer end having a hole extending therethrough;

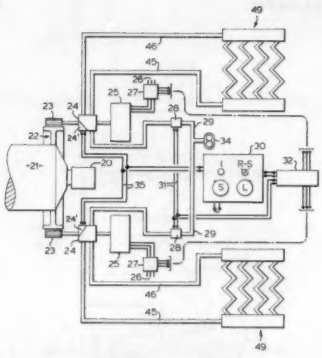
a yoke pivot pin hole in the main element positioned so the amount of weight of the lever on either side is about equal; and

a pressure plate forging pivot hole in the main element positioned between said centrifugal point of adjustment element and said yoke pin pivot hole, said yoke pivot pin and pressure plate forging pivot pin holes being positioned so a line connecting their centers is parallel to the line of said top beam surface.

## 4,298,113
## DRIVE SYSTEM FOR GRINDING MILLS

**Marvin B. Shaver, Beaconsfield; Robert M. Vadas, Dorval, and Norman A. Stock, Lachine, all of Canada, assignors to Dominion Engineering Works Limited, Lachine, Canada**

**Filed Mar. 20, 1978, Ser. No. 888,017**
**Claims priority, application Canada, May 5, 1977, 277773**
**Int. Cl.³ F16D *41/02, 41/28, 43/20***
**U.S. Cl. 192—0.094** **6 Claims**



1. A drive control arrangement, for use with a grinding mill having a drum mounted for rotation on bearing means, a driven gear secured to the drum, twin pinions supported in driving relation with the driven gear, each having an electric motor in driving relation therewith wet clutch means interposed in selective connecting relation between at least one of the said pinions and the related said motor and being generally operative in non-slipping relation therebetween, said wet clutch means including an external coolant circuit to dissipate heat generated in the clutch means, and control means operable to control and selectively interrupt said non-slipping relation including pressure responsive means to control the output torque of the clutch means, pressure sensing means for sensing said clutch control pressure, and pressure control means to limit said pressure to a value corresponding to a predetermined value of torque.

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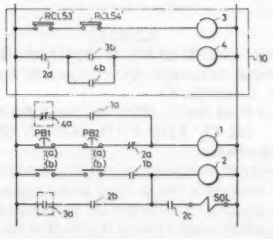
## 4,298,114
## CONTROL CIRCUIT FOR A PRESS

**Shunichi Nagai, and Hidekazu Higashi, both of Komatsu, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan**

**Filed Jul. 16, 1979, Ser. No. 58,071**
**Claims priority, application Japan, Dec. 29, 1978, 53-163940**
**Int. Cl.³ B30B *15/14***
**U.S. Cl. 192—129 A** **9 Claims**



1. A control circuit for a press comprising:

a rotary cam switch which, during each revolution, is closed

at a first slide stroke angle and opened at a second slide stroke angle before a top dead center position of the press;

an operating switch which is moved from a stop position to a run position for starting the press;

a first relay circuit which is not energized when the press is started and is energized upon the closing of said rotary cam switch and self-held thereafter;

a second relay circuit which is energized through the operating switch prior to the starting of the press, is self-held after starting of the press until said rotary cam switch is closed and is deenergized by the closing of said rotary cam switch;

a third relay circuit which is energized by moving the operating switch to the run position when the press is not in operation, is deenergized by moving the operating switch to the stop position before the press reaches the first slide stroke angle, is energized and self-held in a stroke angle range between the first slide stroke angle and the second slide stroke angle and is deenergized by deenergization of said second relay circuit after the press reaches the second slide stroke angle even if the operating switch is in the run position, wherein the rotary cam switch controls the energization of the first, second and third relay circuits; and

drive means for driving the press by energization of said third relay circuit.

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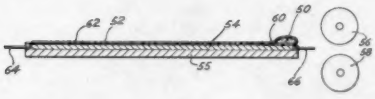
**4,298,115**

## TIME-LAPSE INDICATOR

**Robert F. Bradley, and Lindell P. Bradley, both of New Buffalo, Mich., assignors to Micro-Circuits Company, New Buffalo, Mich.**

**Filed Feb. 9, 1979, Ser. No. 10,688**
**Int. Cl.³ G04F *13/00*; G07F *9/02***
**U.S. Cl. 194—4 F** **21 Claims**




1. A time-lapse indicator comprising a layer of fluid-absorbent material, a particulated electrically conductive material disposed in said fluid-absorbent layer for rendering said layer electrically conductive, a means for holding a fluid in close proximity to said absorbent layer, a fluid migrating at substantially a predetermined rate to said absorbent layer from said holding means, said fluid when absorbed by said absorbent layer varying the conductivity of the absorbent layer in proportion to the degree of absorption of the fluid by the absorbent layer, with the degree of change in conductivity of said absorbent layer being related to the time duration of exposure of said fluid absorbent layer to said fluid to determine the time-lapse following commencement of the fluid transmittal, and a rupturable barrier means separating said fluid from said absorbent layer until said indicator is activated.

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**4,298,116**

## STRING DETECTOR FOR A COIN-SELECTING DEVICE

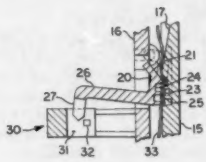
**John F. Niemeyer, St. Louis, Mo., assignor to Coin Acceptors, Inc., St. Louis, Mo.**

**Filed Oct. 17, 1979, Ser. No. 85,582**
**Int. Cl.³ G07F *1/00***
**U.S. Cl. 194—97 R** **6 Claims**

1. A string detector for a coin-selecting device, comprising:

(a) a switch means conditioned to a first state by engagement with and passage of a coin and maintained in the first state by engagement with a string attached to a coin inserted into the device, and conditioned to a second state by disengagement from and passage of a coin in the absence of a string,

(b) coin validation means normally conditioned to a first state, and conditioned to a second state by a valid coin, and




(c) means operatively interconnecting the switch means and coin validation means for determining the handling of the coin depending upon the state of the switch means and coin validation means.

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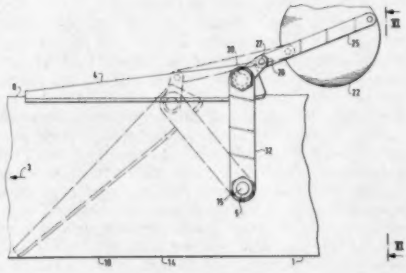
**4,298,117**

## APPARATUS FOR DISCHARGING ARTICLES FROM CONVEYOR BELTS

**Takuo Kobayashi, Nishinomiya, and Yasuyuki Takashima, Osaka, both of Japan, assignors to Sandvik Conveyor GmbH, Fellbach, Fed. Rep. of Germany**

**Continuation of Ser. No. 824,120, Aug. 12, 1977, abandoned.**
**This application Apr. 30, 1979, Ser. No. 34,763**
**Claims priority, application Japan, May 21, 1976, 51-59327**
**Int. Cl.³ B65G *47/46, 47/74***
**U.S. Cl. 198—367** **11 Claims**




1. In a conveyor system wherein articles are placed upon the article-conveyor run of a conveyor belt and are moved along a path which extends past a plurality of discharge stations at which the articles are selectively discharged from the conveyor, article-discharging means at one of said stations comprising a diverter which is adapted to be moved between a retracted position adjacent one edge of but outside said path of said belt and an extended position wherein it presents an article-diverting surface extending across said path substantially between the side edges of said belt at an angle to the direction of belt movement whereby articles being carried by the belt along said path are diverted by said diverter from said belt beyond the other edge of said path, mounting means for said diverter and providing support for said diverter when moving between said retracted position and said extended position with the movement being pivotal with respect to a vertical axis which is between said side edges of said belt and spaced from said one edge of said belt and remote from the downstream end of said diverter, wherein said axis is positioned transversely of said run of said belt with respect to the upstream end of said diverter, a pivot arm rigidly fixed to said diverter adjacent said upstream end, and which includes a vertical shaft extending upward from said pivot arm and providing mounting means therefor, a support arm for said shaft fixed to the other end

thereof and extending horizontally to said pivotal axis above said article-conveyor run and pivot means mounted at said pivot axis and providing pivotal support for said pivot arm.

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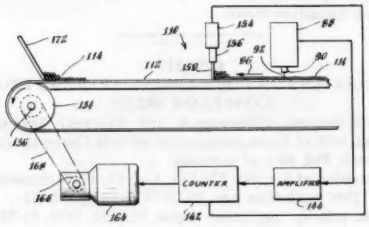
**4,298,118**

## STICK SEPARATING APPARATUS WITH IMPROVED RADIATION COUNTER

**Edward D. Cottrell, Cattaraugus, N.Y., assignor to Champion International Corporation, Stamford, Conn.**

**Filed Dec. 10, 1979, Ser. No. 101,915**
**The portion of the term of this patent subsequent to Mar. 27, 1996, has been disclaimed.**
**Int. Cl.³ B65G *47/14***
**U.S. Cl. 198—382** **1 Claim**




1. An apparatus for receiving a large number of randomly oriented elongated articles and for aligning and separating said articles into groups, each group containing a predetermined number of articles, said apparatus comprising:

(a) an aligning tray for receiving said randomly oriented articles on the upper surface thereof, said surface having means defining a plurality of parallel elongated channels, each of said channels being open at one end and closed at the other end, said tray including a first portion wherein said means defining said channels comprises a convoluted surface forming, in cross section, channels having generally rounded bottom surfaces and generally rounded walls between said channels, and a second portion wherein said means defining said channels defines a plurality of spaced-apart channels each having generally rounded bottom surfaces lower than said rounded bottom surfaces formed by said convoluted surface and a plurality of separators between said spaced apart channels, with the number of channels in said second portion being smaller than the number of channels in said first portion;

(b) means for supporting and repetitively reciprocating said tray in a direction having a component of movement in the longitudinal direction of said channels to cause said articles to enter said channels and move lengthwise toward and out of said open ends;

(c) a plurality of hopper means for receiving articles from said tray, each of said hopper means including an upwardly opening compartment having side walls and a bottom wall, one of said side walls having means defining an exit opening through which articles can pass in a direction perpendicular to their lengths; said hopper means further including a plurality of chutes, equal in number to the number of channels in said second portion of the tray, said chutes being mounted for vibratory movement with said compartments and extending downwardly between said open ends of said channels in said second portion of the tray and said compartments, with the number of said compartments also being equal to the number of channels in said second portion of the tray;

(d) means for supporting said hoppr means adjacent to and below said open ends independently of said tray to receive aligned articles emerging from said open ends, said means for supporting including

means for vertically vibrating said hopper means; (e) belt conveyor means movable below said hopper means to receive said articles and to convey said articles in their aligned side by side arrangment perpendicular to the direction of their lengths to said receiving location;

(f) counting means including light emitting diode sensing means adjacent said hopper means for counting a predetermined number of articles being fed to and disposed on said conveyor means, said sensing means including a source of optical energy adapted to be directed onto said articles carried on said conveyor means, said sensing means further including receiving means disposed adjacent said optical energy source and spaced above said conveyor means for detecting the amount of optical energy reflected by said articles, whereby said sensing means is operable to produce a counting signal each time one of said articles is counted thereby, said signal being generated as a function of reflected light only, such that said conveyor means may be continuous, said counting means further including a counter coupled with said sensing means for receiving and counting said counting signals; and

(g) means under control of said counting means for segregating said predetermined number of articles counted by said counting means from a like number counted thereafter.

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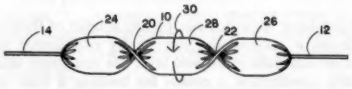
**4,298,119**

## MULTIPLE COMPARTMENT CONTAINERS

**Michael L. Murray, 425 W. Swallow, Ft. Collins, Colo. 80526**

**Filed Jan. 11, 1980, Ser. No. 111,209**
**Int. Cl.³ B65D *79/00***
**U.S. Cl. 206—219** **6 Claims**




1. A multiple-compartment container comprising:

an elongated sleeve of flexible, heat-sealable material;

means defining a first heat-sealing together completely of the walls of one end portion of said sleeve;

means defining a second heat-sealing together completely of the walls of the other end portion of said sleeve;

means defining a third sealing together of the walls of said sleeve at a location spaced between said end portions to define first and second hollow compartments respectively on each side of said third sealing, said third sealing being effected by twisting of said sleeve about its longitudinal axis;

and means defining a fourth sealing together of the walls of said sleeve at a location spaced between said third sealing and one of said end portions to define a third hollow compartment disposed between said first and second compartments, said fourth sealing being effected by twisting of said sleeve about its longitudinal axis;

said third and fourth twisted sealings include a continuous circumferential heat seal readily separated upon a pulling apart of said end portions;

said twistings of said third and fourth sealings are in opposite directions so that the pulling apart of said end portions results in simultaneous untwisting of said third and fourth sealings thereby opening into the original elongated sleeve.

4,298,120

## CHIP-LIKE ELECTRONIC COMPONENT SERIES AND METHOD FOR SUPPLYING CHIP-LIKE ELECTRONIC COMPONENTS

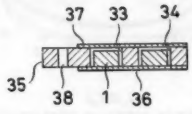
**Fumihiko Kaneko; Koichi Nitta, and Kouichi Saito, all of Takefu, Japan, assignors to Murata Manufacturing Co., Ltd., Japan**

**Filed Nov. 29, 1979, Ser. No. 98,325**

**Claims priority, application Japan, Dec. 26, 1978, 53-163580; Dec. 26, 1978, 53-163581; Dec. 26, 1978, 53-163582; Jan. 9, 1979, 54-2471; Jan. 18, 1979, 54-5100**

**Int. Cl.**[3] **B65D** *73/02, 75/22, 85/30*

**U.S. Cl. 206—329** **26 Claims**




1. A chip-like electronic component series, comprising;

a flexible tape extending in a longitudinal direction and having a plurality of cavities formed therein and distributed along said tape in said longitudinal direction;

a plurality of chip-like electronic components received in respective ones of said cavities; and

cover means for covering said cavities to retain said components therein;

each of said cavities having a quadrilateral first open end;

each of said components having first and second opposite ends and having first and second electrodes formed thereon, respectively, and having a cross section smaller than said first open end of each said cavity, and the shape of each said component cooperating with that of its respective said cavity to cause said component to be received in its respective said cavity with a predetermined orientation, and to prevent said component from rotating therein; and

said cover means being adhered to said tape and having a tensile strength that is greater than the adhesion between said cover means and said tape.

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4,298,121

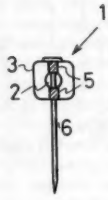
## CONNECTED TEMPORARY FASTENING NAILS FOR USE IN THE ADHESIVE INSTALLATION OF ORNAMENTAL PLYWOOD

**Kunimasa Oide, Kawanishi, and Hideo Ishii, Okayama, both of Japan, assignors to Daichiku Company, Limited, Hyogo, Japan**

**Filed Aug. 8, 1980, Ser. No. 176,531**

**Int. Cl.**[3] **B65D** *83/02, 85/24, 85/62;* **F16B** *13/06*

**U.S. Cl. 206—347** **9 Claims**




1. Connected temporary fastening nails comprising:

an elongate continuous elastic member of substantially square cross-section and having a hollow space formed longitudinally therein;

a plurality of pairs of opposing cuts formed in opposing sides of said elastic member forming connecting parts transverse of said elastic member, said plurality of pairs of opposing cuts being provided at a predetermined spacing; and

a plurality of small diameter nails provided through said elastic member at a predetermined interval along the length of said elastic member and parallel to said connecting parts, one each of said nails being provided between two adjacent connecting parts.

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4,298,122

## METHOD AND APPARATUS FOR APPLYING WARP THREADS TO HAND LOOMS

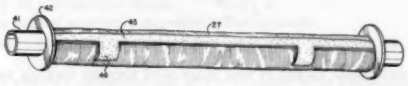
**Christer Ekelund, Bjorkelycka, S-510 10 Horred, Sweden**

**Filed Jul. 19, 1979, Ser. No. 58,930**

**Claims priority, application Fed. Rep. of Germany, Jul. 25, 1978, 7822192[U]**

**Int. Cl.**[3] **B65D** *85/66*

**U.S. Cl. 206—389** **6 Claims**



1. A package of warp threads for installation on a hand loom having heddles and a warp beam comprising a series of warp threads, a support consisting of a disposable cylinder, an anchor strip extending along the length of said support for releasably anchoring said warp threads to the support in a given sequence corresponding to the sequence of the threads in said hand loom, with the inner ends of the warp threads all projecting beyond the anchor strip to provide free ends to be drawn through the heddles, the warp threads all being wound circumferentially of said support to protect said free ends and to provide a given length of warp threads thereon, disc-like flanges spaced inwardly from the ends of said support for guiding and limiting the warp threads adjacent thereto, the ends of the support beyond said flanges forming hand holds for handling the package without damage to the threads during installation, an adhesive transfer tape secured to the outer ends of the warp threads to maintain said threads in said desired sequence for attachment to the warp beam, said tape extending longitudinally of the support and holding the warp threads on the support, said transfer tape being releasably anchored to the underlying warp threads to provide a package capable of being handled without disruption of the warp threads therein, said tape being displaceable with the outer ends of the warp threads secured thereto from said underlying warp threads onto the warp beam of the hand loom, and operable to be secured to said beam to anchor all of said warp threads thereon.

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4,298,123

## CARTON CORE RETAINERS

**Harry I. Roccaforte, Western Springs, Ill., and Jimmy J. Hanko, Racine, Wis., assignors to Champion International Corporation, Stamford, Conn.**

**Filed Jan. 30, 1980, Ser. No. 116,357**

**Int. Cl.**[3] **B65D** *85/67, 85/671, 5/50*

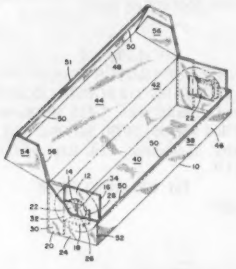
**U.S. Cl. 206—396** **15 Claims**

1. In a carton having at least three sides and end walls for containing a product on a hollow core, at least one carton end wall forming a core retainer comprising:

a. an inner wall coupled to a first side of said carton and having an orifice therein, said inner wall including means adjacent said orifice defining a slotted detent,

b. an overlapping wall coupled to a second side of said carton and having a projection thereon extending through said orifice into said hollow core whereby said core is held in said carton, said overlapping wall including a panel having one side coupled to said second side of said carton, a projection hingedly coupled to the other side of said

panel, a fold line in said projection allowing said projection to bend about said fold line and form a V-shaped insert pointedly extending into said hollow core, and locking means including a locking tab hingedly connected to the outer end of said projection for engaging said slot-



ted detent means in said inner wall thereby locking said V-shaped insert within said hollow core, and

c. an outer wall coupled to a third side of said carton for closing the end of said carton, said outer wall overlying a portion of said projection and said locking tab.

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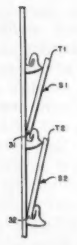
**4,298,124**

**SLIDE PROGRAMMING DEVICE**

**Frederic McCurdy, Newburgh, N.Y., assignor to Graphic Technology, Inc., Newburgh, N.Y.**

**Filed Jan. 7, 1980, Ser. No. 110,036**
**Int. Cl.³ B65D** *85/30*
**U.S. Cl. 206—455** **8 Claims**



1. A holding device for the sorting or editing of slides and the like comprising:

a transparent rigid planar backing member; and

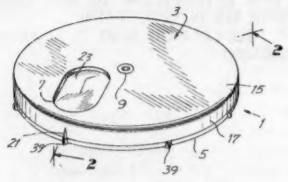
means mounted on one face of the planar backing member for holding slides on the backing member in at least one row comprising at least two slide holding strips spaced apart by a distance not greater than the length of the slides to be held and each strip comprising resilient flexible material having a first portion coactive with the one face of the backing member to form an expandable slot receptive of the bottom edge of a slide therebetween in a partially inserted position in response to a first substantially downward force to retain the slide for easy removal and in a fully inserted position in resonse to a second substantially downward force greater than the first force to retain the slide to prevent lateral movement and inadvertent removal thereof and a second portion for engaging the top portion of the slide when the slide is in the partially or fully inserted position to maintain the top edge in a spaced apart relationship with respect to the one surface of the backing member.

**4,298,125**

**DIAL TYPE CHILD RESISTANT DISPENSER**

**Walter G. Berghahn, Scotch Plains, and Jack Weinstein, Old Bridge, both of N.J., assignors to Bristol-Myers Company, New York, N.Y.**

**Filed May 19, 1980, Ser. No. 151,062**
**Int. Cl.³ B65D** *83/04;* **G09F** *9/40*
**U.S. Cl. 206—531** **6 Claims**



1. An opaque child resistant dispensing package for tablets and the like comprising:

(a) first and second sections, said sections being adapted to be rotated with respect to each other about a common axis;

(b) a first end wall in said first section, a dispensing opening cut through said first end wall and first position indicator means associated with said dispensing opening to assist in positioning said opening for dispensing said tablets;

(c) a second end wall in said second section, a plurality of flexible open-ended pockets adapted to hold tablets and the like depending from said second end wall; each of said flexible pockets having associated therewith a second position indicating means; and

(d) rupturable opaque sheet material secured to said second end wall and spanning the open ends of said pockets;

said dispensing package being adapted to rotate said sections to bring said first and second position indicator means into registration with each other whereby pressure may be applied to said pocket to push said tablets through said opaque sheet material.

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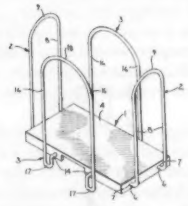
**4,298,126**

**ADJUSTABLE HOLDER**

**Edwin A. Filipowicz, Greenfield, Wis., assignor to Griffith-Hope Company, Milwaukee, Wis.**

**Filed Aug. 27, 1979, Ser. No. 69,785**
**Int. Cl.³ A47F** *7/00*
**U.S. Cl. 211—50** **9 Claims**



1. An adjustable holder for holding articles, comprising a base having an upper surface to support a stack of articles, a plurality of retaining members connected to the sides of the base and extending upwardly from the base, each retaining member including a first section disposed beneath the base and a second section connected to the first section and extending upwardly beyond the base, oppositely disposed retaining members include connecting sections connecting the respective first

section and the second section, said connecting sections extending downwardly from the first sections to a level below the base to provide a support for the holder, a locking member connected to the base and engaged with the first section of each retaining member to lock the first section against movement with respect to the base, each locking member including a pair of spaced arms disposed in a non-parallel condition and having aligned openings to receive the respective first section, flexing of said arms toward a parallel condition enabling the respective first section to be freely moved within the aligned openings to extend and retract the retaining member relative to the base, release of the arms causing the arms to return to said non-parallel condition to firmly grip the respective first section and lock the first section against movement relative to the base.

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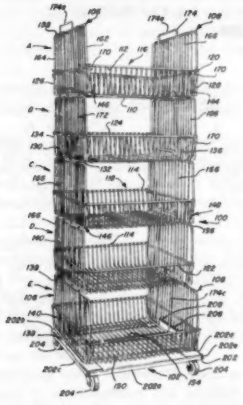
**4,298,127**

## STACKING BASKET ASSEMBLY

**Clarence W. Upshaw, Tuttle, and Richard A. Goodwin, Moore, both of Okla., assignors to Unarco Industries, Inc., Chicago, Ill.**

**Filed Aug. 3, 1979, Ser. No. 63,199**
**Int. Cl.³ A47F 5/01**
**U.S. Cl. 211—126** **18 Claims**



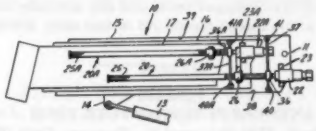
1. A basket assembly which comprises a plurality of wire baskets, each of said baskets having a plurality of wire walls defining a lading-carrying space, said walls including a bottom wall and removable end walls, each of said walls having an array of interconnected wires including a plurality of wire elements and a peripheral wire connected to and bounding said wire elements, and each of said walls defining a foraminous barrier for substantially preventing access therethrough into the lading-carrying space of said basket and confining goods carried in said basket, said barrier substantially preventing said goods from passing through the area bounded by said peripheral wire, each of said baskets having connecting means comprising a pair of laterally opposed camming ears extending outwardly of each of said end walls for detachably connecting said removable end walls to said basket in an erect position, said end walls of each basket being removable for permitting the bottom walls of said wire baskets to be nested within each other with said removed walls lying upon the bottom wall of the uppermost nested basket during storage, and each of said wire baskets including stacking means for stacking the wire baskets upon each other in a substantially vertical tier when the end walls are connected to the baskets in the erect position.

**4,298,128**

## MOVABLE SUPPORT FOR ROTATABLE EXTEND/RETRACT SCREW IN TELESCOPIC CRANE BOOM

**Narahari Gattu, Cedar Rapids, Iowa, assignor to Harnischfeger Corporation, W. Milwaukee, Wis.**

**Filed Feb. 19, 1980, Ser. No. 122,488**
**Int. Cl.³ B66C 23/06**
**U.S. Cl. 212—267** **8 Claims**



1. In a telescopic boom:
a pair of relatively movable boom sections;
an elongated rotatable screw rotatably mounted on one boom section;
a primary thread on said screw engaged with a primary nut on the other boom section whereby screw rotation effects relative telescopic movement of said boom sections;
a secondary thread on said screw of different lead than said first thread and engaged with a secondary nut;
and a support connected to and movable with said secondary nut, said support being movably mounted on one of said boom sections whereby said screw rotation also effects axial movement of said support at a different rate than said telescopic movement of the boom sections to a supporting position wherein it supports said screw intermediately thereof.

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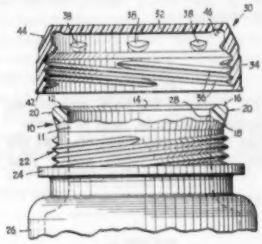
**4,298,129**

## CHILDPROOF, SNAP-ON, TWIST-OFF SAFETY CAP AND CONTAINER

**Morton Stull, Split Rock Rd., Boonton Township, Morris County, N.J. 07005**

**Filed May 2, 1980, Ser. No. 146,033**
**Int. Cl.³ B65D 55/02**
**U.S. Cl. 215—224** **12 Claims**



1. A childproof, push-on, quarter-turn, twist-off cap construction in a dispensing container, comprising in combination:
(a) a container neck having exterior screw thread means and having a conical camming surface,
(b) a resilient screw cap having internal screw threads means cooperable with the screw thread means of the container neck, all of said screw thread means being adapted to enable the cap to be forced onto the neck under straight axial pressure which forces the screw thread means to bypass each other,
(c) yieldable detent means on the screw cap, engageable and cooperable with the camming surface of the container neck, said detent means normally tending to either com-

plete the applying movement of the screw cap or else the removing movement of the same, and

(d) cooperable sealing surfaces on said container neck and screw cap,

(e) the number and pitch of said screw thread means enabling them, from any given rotative position of the screw cap with respect to the container neck, to shift said screw cap off of said neck in response to substantially a quarter turn in the unscrewing direction while the cap is being deformed by opposing, radially-inward pressures thereon which are sufficient to maintain its screw thread means in a deep driving position with respect to the screw thread means of the container neck, said cap normally maintaining its screw thread means out of said deep driving position.

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**4,298,130**

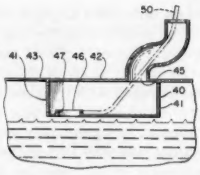
**ANTI-THEFT MOTOR FUEL TANK**

**Abraham Ifrach, 3220 Dalemead St., Torrance, Calif. 90505**

**Filed Aug. 18, 1980, Ser. No. 179,058**

**Int. Cl.³ B65D *25/02, 25/20***

**U.S. Cl. 220—20** **9 Claims**




1. An anti-theft motor fuel tank system comprising a main fuel tank having an inlet opening in its upper portion, a vestibular tank having an inlet opening in its upper portion and an outlet opening in its lower portion laterally offset from the inlet opening of said vestibular tank; said vestibular tank being secured to said main tank with its outlet opening in communication with the interior of said main tank, and a rim extending around the outlet opening of said vestibular tank and upwardly interiorly thereof whereby a predetermined amount of fuel may be retained in said vestibular tank and passage of a siphon tube from the inlet opening through the outlet opening of said vestibular tank is prevented while permitting siphoning thereby of such retained fuel.

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**4,298,131**

**POT LID**

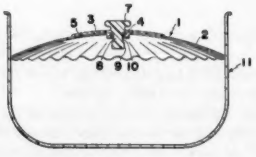
**Shoji Saito, 2-227 Kofudai, Ichihara, and Mitsuo Nagashima, 4-53-14 Maruyama Funabashi, both of Japan**

**Filed Sep. 22, 1980, Ser. No. 189,140**

**Claims priority, application Japan, Apr. 2, 1980, 55-44354**

**Int. Cl.³ B65D *51/16***

**U.S. Cl. 220—231** **4 Claims**




1. A pot lid for use with a vessel comprising:

a plate having a central portion and an outer circumferential portion surrounding the central portion, the central portion having a threaded opening in the center thereof and a plurality of openings surrounding the threaded opening, the outer circumferential portion having a plurality of grooves formed therein extending to the outer side edges of the plate; and

a cover member having a cover portion with a size sufficiently large to cover said plurality of openings, a grip protruding upwardly from a central region of the cover portion, and a rod projecting downwardly from said grip through an opening formed in the cover portion, said rod having a threaded end portion engageable with the threaded opening of said plate to thereby interconnect said plate and cover member, said rod further having an unthreaded portion positioned between said end portion and said grip so that said cover portion is guided by said unthreaded portion for movement between a first position covering said plurality of openings and a second position vertically spaced above said openings, said cover portion in said first position blocking fluid flow through said openings and being moved from said first position towards said second position by pressure increase within the vessel during heating thereof and being moved from said second position towards said first position by gravity.

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**4,298,132**

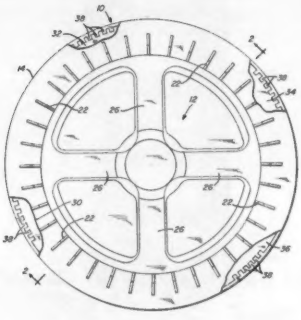
**CHILD-PROOF LID AND PAIL ARRANGEMENT**

**Herbert W. Galer, Newnan, Ga., assignor to United States Steel Corporation, Pittsburgh, Pa.**

**Filed Mar. 24, 1980, Ser. No. 132,738**

**Int. Cl.³ B65D *41/04***

**U.S. Cl. 220—288** **4 Claims**




1. In a stiff molded plastic pail and lid therefor, said lid having an inverted U-shaped rim containing threaded portions and configured to fit over and receive the upper periphery of said pail, said pail having threaded portions about its outer upper periphery for mating with said threaded portions of said lid, the improvement comprising:

first engagement means comprising a first plurality of toothed areas located on the inner wall of said lid rim, said toothed areas extending radially inwardly from said inner wall toward the center of said lid; and

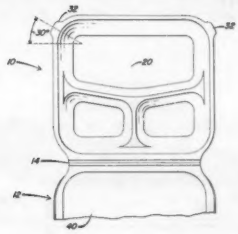
second engagement means comprising a second plurality of toothed areas, configured to releasably mate with at least a portion of said first plurality of toothed areas, said second toothed areas being located along the upper outer periphery of said pail, but out of phase with respect to said first plurality of toothed areas extending radially outwardly and at least a portion thereof being matable with said first engagement means when said lid is threaded down upon said pail for preventing rotation of said lid with respect to said pail by a child, the threaded engagement between said pail and said lid preventing prying off of the latter by a child, whereby the pail and lid are child-proof when closed.

**4,298,133**

## INTEGRAL TRAY AND COVER WITH SNAP LOCK

**Paul Davis, Swampscott, Mass., assignor to Sweetheart Plastics, Inc., Wilmington, Mass.**

**Filed Aug. 20, 1979, Ser. No. 67,935**
**Int. Cl.³ B65D** *6/34, 43/10, 43/14*
**U.S. Cl. 220—306** **5 Claims**




1. A foam plastic disposable food container comprising:
a generally rectangular bottom tray and cover integrally formed with one another of foam plastic and joined together along a common side edge that defines a hinge on one side of the tray and cover allowing the cover to pivot on the tray from a closed position wherein the cover lies on top of the tray to an open position wherein the cover is substantially coplanar with and disposed beside the tray,
said tray having a bottom wall and an upstanding, outwardly flared peripheral side wall about the four sides of the bottom wall,
said cover having a top wall and a depending downwardly flared peripheral side wall about the four sides of the top wall,
an outwardly extending flange about the upper edge of the side wall of the tray on each of the other three sides of the bottom wall to which the cover is not hinged, and an outwardly extending flange about the lower edge of the side wall of the cover and overlying the flange on the tray when the cover is closed,
a skirt extending downwardly from the outer edge of the flange on the cover and covering the outer edge of the flange on the tray,
tabs formed at two adjacent corners of the tray remote from the hinge and lying in the plane of and forming extensions of the flange on the tray,
said tabs extending away from each other at the same angle with respect to an imaginary line parallel to the hinge,
and undercut tab seats formed on the corners of the cover corresponding to the corners carrying the tabs on the tray, said seats receiving the tabs at the corners to releasably lock the cover closed.

5. A foam plastic disposable food container comprising:
a bottom tray and cover integrally formed with one another and joined together along a common side edge that defines a hinge on one side of the tray and cover allowing the cover to pivot on the tray from a closed position wherein the cover lies on top of the tray to an open position wherein the cover is substantially coplanar with and disposed beside the tray,
said tray having a bottom wall and an upstanding peripheral side wall about the sides of the bottom wall,
said cover having a top wall and a depending peripheral side all about the sides of the top wall,
an outwardly extending flange about the upper edge of the side wall of the tray and an outwardly extending flange about the lower edge of the side wall of the cover and overlying the flange on the tray when the cover is closed,
a skirt extending downwardly from the outer edge of the flange on the cover and covering the outer edge of the flange on the tray,
at least one tab formed on the tray remote from the hinge and forming an extension of the flange on the tray in the same plane as said flange,
said tab being thinner and more dense than the side wall of the tray for greater strength and stiffness,
and an undercut tab seat formed on the cover and aligned with the tab on the tray when the cover is closed, the top of said seat defined by the outwardly extending flange of the cover, said seat receiving the tab to releasably lock the cover closed, said skirt being thinner and more dense at the region of the undercut tab seat than in other regions to provide greater strength and stiffness at the seat,
said tab and seat being at an acute angle with respect to the hinge.

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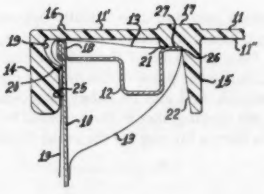
**4,298,134**

## SYSTEM FOR REUSING PAINT CANS

**Herman L. Lewis, Jr., 22 Marsh Creek Rd., Amelia Island, Fla. 32034**

**Filed Jul. 10, 1980, Ser. No. 168,205**
**Int. Cl.³ B65D** *41/18, 25/16*
**U.S. Cl. 220—307** **9 Claims**




1. A system for reusing paint cans comprising a paint can with a circular groove lip seal adapted to receive a metallic lid with a circular tongue complementary to said groove; a flexible plastic film bag liner disposed within and covering the inside surfaces of said paint can and with the open end of said bag turned back over said lip seal and draped downwardly over the upper outside portion of said can; and a circular semi-flexible plastic lid for said can having a continuous outer shoulder depending from the lower surface of said cover adjacent its outer edge to fit snugly over the bead joining the side wall of said can with said circular groove lip seal portion, and having a continuous circular inner shoulder depending from said lower surface of said cover and spaced inwardly from and parallel to said outer shoulder and fitting snugly over the inner edge of said circular groove lip seal portion, said cover having projecting upwardly from the planar upper surface thereof an outer and an inner continuous and concentric ring, said outer ring being aligned immediately above said bead and being substantially as wide laterally as the lateral thickness of said bead and said inner ring being located immediately above said inner edge and laterally spanning outwardly and inwardly from said inner edge.

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**4,298,135**

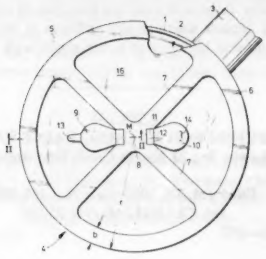
## COVER FOR FRYING PANS OR SIMILAR VESSELS

**Franz Vossen, Stockach, Fed. Rep. of Germany, assignor to Huggles & Meurer, Libellenweg, Fed. Rep. of Germany**

**Filed Jun. 18, 1979, Ser. No. 49,344**
**Claims priority, application Fed. Rep. of Germany, Apr. 12, 1979, 2915274**
**Int. Cl.³ B65D** *51/16*
**U.S. Cl. 220—371** **5 Claims**

1. A throw away cover for a frying pan comprising a planar disk of cardboard material mountable on a frying pan to cover the same, said disk having stamped-out sector-shaped windows defining a circumferential ring, a plurality of spoke arms extending radially from said ring and a region in which said spoke arms merge, and a filter paper adhesively secured on the

underside of said disk and covering said sector-shaped windows, said filter paper being liquid-absorptive and at least partially air pervious, said sector-shaped windows being arranged in diametrically opposed pairs, said disk including two solid tongue-shaped tabs remaining after the sector-shaped windows are stamped-out, said tabs extending in the plane of said disk from said central region radially outwards in diametric opposition into two diametrically opposed windows, said tabs being foldably attached to said central region so that when upfolded from the plane of the disk the tabs are substantially perpendicular to the plane of the disk in opposed horizontally spaced relation, said tabs including interengageable members to secure the tabs together in the upfolded horizontally spaced position to form a lift ring for the cover in said central region.



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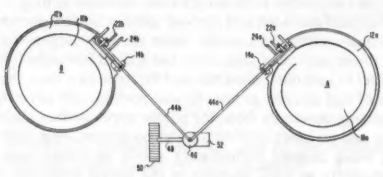
**4,298,136**

## METHOD AND APPARATUS FOR SUPPLYING FILAMENT COILS TO A MOUNT MACHINE

**Arthur Hollenbeck, West Caldwell, and James Petro, Little Falls, both of N.J., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Dec. 31, 1979, Ser. No. 109,009**
**Int. Cl.³ B65H *51/16***
**U.S. Cl. 221—1** **7 Claims**



1. A method of delivering filament coils to a mount machine comprising the steps of:

providing at least two separate storage containers for a plurality of filament coils with each of said at least two separate storage containers having a filament coil discharge location;

sensing the need for a coil on said mount machine;

sensing the presence or absence of a filament coil at a first of said filament coil discharge locations;

sensing the presence or absence of a filament coil at a second of said filament coil discharge locations;

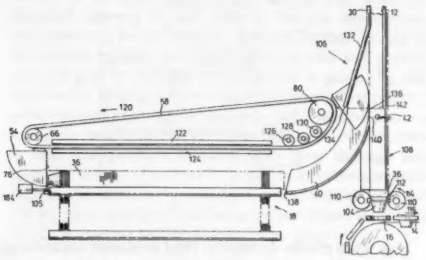
preselecting alternately one of said filament coil discharge locations and directing a short burst of air at said preselected filament coil discharge location when the presence of a filament coil is sensed at said preselected filament coil discharge location and the need for a coil is indicated by said mount machine to thereby deliver a filament coil to said mount machine.

**4,298,137**

## AUTOMATIC CONTAINER FEED FOR CONTAINER HANDLING DEVICE

**Derek V. Mancini, Markham, and William J. Wright, Orillia, both of Canada, assignors to Consumers Glass Company Limited, Etobicoke, Canada**

**Filed Jan. 28, 1980, Ser. No. 116,274**
**Int. Cl.³ B65G *59/06***
**U.S. Cl. 221—11** **62 Claims**



1. An apparatus for loading a stack of containers into a container chute comprising means for supporting a row of stacked containers on its side, said chute having a container side entrance spaced above the bottom of and below the top of said chute to define upper and lower chute portions, said upper chute portion being of a height to receive a row of stacked containers, means for guiding pushed movement of a stack of containers from said support means through said container side entrance, means for pushing a stack of containers along said support means and guide means upwardly into said chute upper portion and releasing contact with such stack located in said chute upper portion to permit such stack to drop past said entrance into said chute lower portion.

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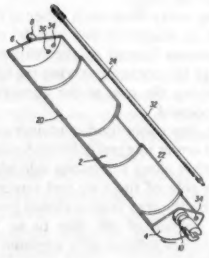
**4,298,138**

## TANDEM COLUMN VENDER APPARATUS

**Kenneth W. Oden, Charles Town, W. Va., assignor to Dixie-Narco, Inc., Ranson, W. Va.**

**Filed Feb. 29, 1980, Ser. No. 125,923**
**Int. Cl.³ B65G *59/00***
**U.S. Cl. 221—115** **7 Claims**



1. In a vending machine:

means defining a compartment adapted to hold front and rear columns of cylindrical articles of predetermined diameter;

a dispensing cradle in the lower end portion of said compartment and comprising a hollow, open-sided semicylindrical cradle extending from front to rear of said compartment and mounted for rotation about its axis, said axis extending from front to rear of said compartment;

said cradle having a straight axially extending leading edge and a stepped trailing edge for sequentially dispensing

articles therein from between said stepped edge and a compartment wall, and sequentially from said front and rear columns upon rotation of said cradle about its axis;

the internal diameter of said cradle being substantially equal to the diameter of said cylindrical articles whereby rotation of said cradle with cylindrical articles therein and columns of said articles thereabove will cause said leading edge to move between the articles in said cradle and those thereabove, without substantially lifting said column, to support the latter while sequentially dispensing those in the cradle.

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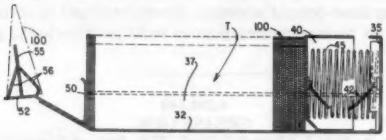
**4,298,139**

## CUP DISPENSER

**John R. Radek, Hinsdale, Ill., assignor to Ready Metal Manufacturing Company, Chicago, Ill.**

**Filed Jul. 30, 1979, Ser. No. 61,709**
**Int. Cl.³ B65H *1/02***
**U.S. Cl. 221—198** **1 Claim**




1. A dispenser for disposable cups in collapsed stacked condition, comprising

a. a sleevelike housing having side walls and an open front portion,

b. a relatively shallow tray member slidable through said front portion and having a bottom portion for supporting a stack of flattened disposable cups, side walls, and a front cup-retaining portion attached to and carried by the tray member and protruding beyond said open front portion in the retracted position of said tray member,

c. a follower for resiliently urging cups forwardly in the tray,

d. latching means on the outside of said housing and tray member for detachably securing the tray in the housing, and

e. means comprising an arcuate concave recess at the front of the upper wall of said housing, whereby a limited number of cups is exposed for digital extraction from the tray.

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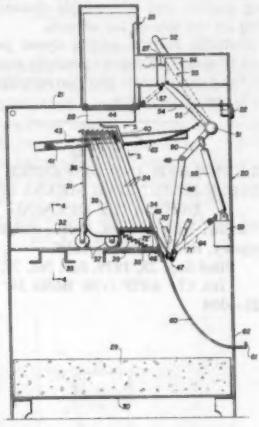
**4,298,140**

## NEWSPAPER AND MAGAZINE VENDING MACHINE

**Walter K. Owens, P.O. Box 1032, Crestview, Fla. 32536**

**Continuation-in-part of Ser. No. 14,920, Feb. 26, 1979, Pat. No. 4,239,127. This application Apr. 17, 1980, Ser. No. 140,986**
**Int. Cl.³ B65G *59/08***
**U.S. Cl. 221—232** **12 Claims**

1. A vending machine for newspapers and the like comprising a cabinet including a coin mechanism having a normally locked control element which is released by insertion of proper coins in the coin mechanism, a newspaper carriage horizontal guideway in the cabinet, a newspaper carriage mounted for movement on the guideway including means biasing the carriage forwardly toward the front of the cabinet, a retainer plate at the front of the guideway lapping the lower folded edge portion of the leading newspaper held against the retainer plate by the carriage, a gravity delivery chute for newspapers depending from the forward end of the guideway and leading to a delivery opening in the front of the cabinet below the guideway, a leading newspaper clamping plate in the cabinet above the elevation of said retaining plate and overlapping the top edge portion of each leading newspaper advanced by the carriage and exerting holding pressure thereon, resilient means biasing said clamping plate rearwardly toward the front face of the leading newspaper, a newspaper lifting plate in the cabinet near the forward end of said carriage guideway and adapted cyclically to engage the bottom folded edge of each leading newspaper and lift such edge above the top of the retainer plate and then release it so that each leading newspaper may free-fall onto said delivery chute, a manual linkage in the cabinet operatively connected with said lifting plate including a hand lever arranged exteriorly of the cabinet and operated by customers,



said linkage including an arm within the cabinet to engage and move the control element of the coin mechanism after release thereof, and said linkage further including a substantially unstretchable flexible element attached to said clamping plate and becoming taut to relieve the pressure of the clamping plate on each leading newspaper only after said lifting plate has lifted the lower folded edge of each newspaper above the top of said retainer plate.

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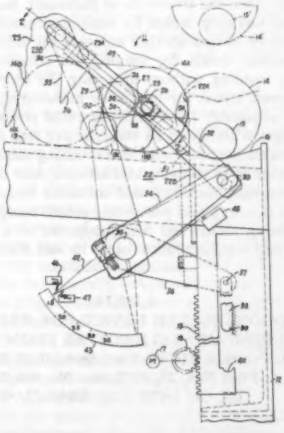
**4,298,141**

## OBJECT SEPARATOR

**Valdas S. Ramunas, Euclid, Ohio, assignor to Acme-Cleveland Corporation, Highland Heights, Ohio**

**Filed May 3, 1979, Ser. No. 35,633**
**Int. Cl.³ B65G *59/00***
**U.S. Cl. 221—251** **16 Claims**



16. An escapement mechanism having a pallet insertable

along a first path into and removable from a second path of movement of serially disposed objects movable along a surface toward an exit end thereof,

characterized in that said mechanism is automatic size compensating by means mounting said pallet for movement toward the objects along the first path which intersects and crosses at an acute angle of less than 45° the second path of movement of the objects, said second path of movement of the object being parallel to the object supporting surface and of variable distance therefrom depending on the size of the objects,

and an abuttable surface on the upper part of said pallet adapted to abut and move upwardly and away from said exit end any said objects lying on serially disposed objects which lie on said surface.

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**4,298,142**

## ARTICLE HOLDER AND DISPENSER INCLUDING ADJUSTABLE DISPENSING MEANS AND ONE-WAY DISCHARGE OPENING

**Lorne R. Stanley, Hillsborough, Calif., assignor to Safe-T Pacific Company, Redwood City, Calif.**

**Filed Sep. 28, 1979, Ser. No. 79,705**

**Int. Cl.³ A47F *1/08*; B65G *59/10***

**U.S. Cl. 221—304** **10 Claims**

1. An article holder and dispenser for nested articles such as ice cream cones, cups and the like comprising an elongate hollow container means for storing the articles therein, said container means having an interior surface and defining a discharge opening at one end thereof for dispensing the articles therethrough, a plurality of circumferentially spaced article retaining means located within said container means adjacent its interior surface and the periphery of said discharge opening for establishing the effective size of said opening in order to releasably retain the articles to be dispensed, means supporting all of said retaining means for limited circumferential movement relative to one another adjacent the interior surface of said container means for varying the effective size of said discharge opening without distorting the shape of said container means, means for releasably maintaining said retaining means in adjustably fixed circumferential positions relative to one another whereby to fix the effective size of said opening and means cooperating with said retaining means for preventing the latter from allowing said articles, once dispensed, from being re-inserted back into said container means through said discharge opening, said preventing means being separate from said retaining means and being disposed in a fixed position adjacent said retaining means opposite said discharge opening.

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**4,298,143**

## TIME-CONTROLLED DEVICE FOR PREVENTING POURING OF STALE COFFEE FROM FLASKS

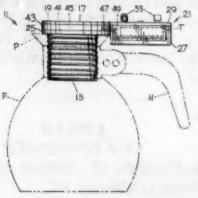
**Charles J. Peterson, 214 W. Vine, Springfield, Ill. 62704**

**Filed Nov. 27, 1978, Ser. No. 959,930**

**Int. Cl.³ B67D *5/08*; G04C *23/38***

**U.S. Cl. 222—70** **6 Claims**

1. A time-controlled device in combination with, and for preventing the pouring of stale coffee from a conventional coffee-maker flask, comprising: a generally cylindrical stopper for closing the throat of said flask and having a pouring passage therethrough, valve means movable between passage-closing and passage-opening positions, means for moving the valve means between the passage opening and the passage




closing positions, and a seperate manually settable mechanical timer means cooperating with said means for moving for providing timer-delayed automatic movement of said valve means from its passage-opening position to its passage-closing position.

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**4,298,144**

## GREASE GUN

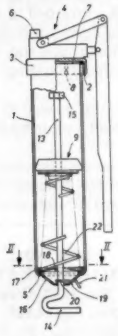
**Klaus A. Pressi, Obermichelbach, Fed. Rep. of Germany, assignor to Jakob Pressl Sohne, Nuremberg, Fed. Rep. of Germany**

**Filed Apr. 11, 1979, Ser. No. 29,121**

**Claims priority, application Fed. Rep. of Germany, Apr. 12, 1978, 2815699**

**Int. Cl.³ F16N *3/12***

**U.S. Cl. 222—256** **7 Claims**




1. A grease gun comprising a tubular casing; a pump attachment for one end of the casing; a cover mounted internally at the other end of the casing, engaging a turned-in rim portion thereof, said cover having a section for projecting from said other end of the casing and being axially movable within the casing, said cover further being provided with an outer guide ring section fitting internally on said turned-in rim portion, the ratio of the outer diameter of said cover to the width of said outer guide ring section being about 6.5 to 8.5; a draw rod axially slidably disposed in said casing, said draw rod extending through said projecting part of said cover and terminating in a handle; a pressure collar encircling said draw rod within said casing; a disc within said outer guide ring section; a compression spring means within said casing operating between said collar and said disc; a selectively openable and closeable means for providing for escape of air from within said casing at said one end of said casing; and means for fixing the axial position of said draw rod relative to said cover comprising

clamping means for said draw rod internally of said cover and operating means for said clamping means externally of said cover, said operating means comprising a substantially radially extending operating member of smaller radial extent than the width of said casing.

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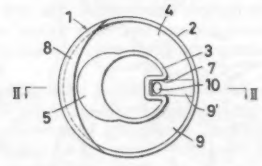
**4,298,145**

## ADAPTER FOR A CONTAINER

**Motoyori Iida, 106, 4-chome, Kasugaoka, Itami-shi, Hyogo-ken, Japan**

**Filed Oct. 9, 1979, Ser. No. 82,588**
**Claims priority, application Japan, Mar. 9, 1979, 54-31436[U]**
**Int. Cl.³ B67D *3/00*; B65D *51/16***
**U.S. Cl. 222—478** **5 Claims**




1. An adapter for a liquid container comprising:
an outer tube for mounting on a liquid container;
an inner tube having a pouring lip on its upper edge on one side thereof and a groove on the outer surface thereof which extends from the top end of said inner tube, at a position opposite to said pouring lip, to the bottom end thereof;
said inner tube including a wall which separates said groove from the interior space of said inner tube; and
a guide plate connecting said outer tube and inner tube together, said guide plate being inclined from under said pouring lip toward the lower end of said groove, said guide plate having a hole located at a position within said groove for venting air therethrough.

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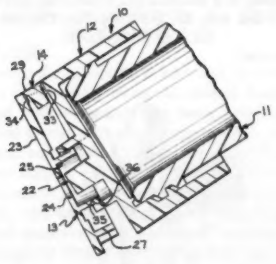
**4,298,146**

## ONE-PIECE DISPENSING CLOSURE

**Gary V. Montgomery, Evansville, Ind., assignor to Sunbeam Plastics Corporation, Evansville, Ind.**

**Filed Aug. 23, 1979, Ser. No. 69,116**
**Int. Cl.³ B65D *47/08***
**U.S. Cl. 222—536** **8 Claims**




1. A dispensing closure for a liquid container comprising: a cap having means for retaining it on the neck of a container and a top with a dispensing opening therethrough, a lid having a dispensing opening therethrough, an integral hinge connecting said cap and said lid and constraining said lid for angular movement of said lid to and from a closed position when said lid is pressed down against the top of said cap. a plug on one of said cap and said lid of such size as to extend into and close the dispensing opening in the other of said cap and said lid when said lid is in the closed position, and cooperating means including portions on said cap and said lid engageable for normally limiting the relative angular movement of said lid and said cap about said hinge from the closed position to an open dispensing position in which said plug is withdrawn from the dispensing opening in the other of said cap and said lid and in which said lid overlies and engages with said cap to resist further relative opening movement.

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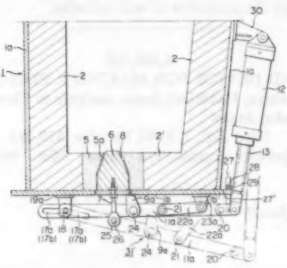
**4,298,147**

## DISCHARGING MECHANISM FOR MOLTEN METAL AND SLAG REMAINING IN TUNDISH FOR CONTINUOUS CASTING MACHINE

**Akira Honda, Kamakura; Takanori Anzai, Yokohama; Minoru Kitamura, Fukuyama; Masaru Ishikawa, Fukuyama, and Seishi Mizuoka, Fukuyama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan**

**Filed Jul. 26, 1979, Ser. No. 60,882**
**Claims priority, application Japan, Aug. 24, 1978, 53/102330**
**Int. Cl.³ B22D *11/10***
**U.S. Cl. 222—601** **6 Claims**




1. A discharging mechanism for molten metal and slag remaining in a tundish provided with at least one pouring nozzle for a continuous casting machine, comprising:
a discharging nozzle having a discharging bore outwardly flaring downwardly, for discharging molten metal and slag remaining in said tundish, said discharging nozzle being attached to the bottom wall of said tundish substantially at the center of said bottom wall, said discharging nozzle being separate and distinct from said pouring nozzle and being operable independently of said pouring nozzle;
a frustoconical plug mating with said discharging bore of said discharging nozzle, and being releasably inserted from outside said bottom wall of said tundish into said discharging bore;
a plug fitting fixed to the lower end of said plug; and
a plug engaging means connected to said plug fitting for selectively inserting said plug into said discharging bore of said discharging nozzle, holding said plug in said discharging bore of said discharging nozzle and withdrawing said plug from said discharging bore of said discharging nozzle, said plug engaging means including:
first and second pairs of supports fixed to the lower surface of the bottom wall of said tundish;
a pair of levers arranged in parallel with each other and substantially horizontally below said tundish at positions which said plug located therebetween, said pair of levers, at a first end portion thereof being respectively slidably connected via an axle to said first pair of supports, and, substantially at the center of said pair of levers, being connected via an axle and a pair of branch levers to said second pair of supports;
a plug stopper for inserting said plug into said discharging bore of said discharging nozzle and holding same therein so as not to allow it to drop out therefrom, said plug

stopper being fixed, at a position below said plug, to the center of a fixed axle extending across the space between said pair of levers;

a cylinder and a flexible rod, said cylinder being connected via an axle, substantially vertically to a further support fixed to the outer surface of the side wall of said tundish, and, the end portion of said flexible rod being connected via an axle to the other end portion of said pair of levers;

said plug fitting having a hole at an end portion thereof; and

a pin inserted into said hole in said plug fitting and projecting out from said pair of levers, said pin being inserted into said hole to be in contact with the lower surface of said pair of levers, thereby coupling said plug to said pair of levers;

whereby said plug is firmly inserted into said discharging bore of said discharging nozzle and held therein so as not to allow it to drop out therefrom by means of said plug stopper, by raising said pair of levers, with end portions thereof as the fulcrum, by causing said flexible rod to contract through the actuation of said cylinder; and on the other hand, said plug is withdrawn from said discharging bore of said discharging nozzle by means of said pin, by lowering said pair of levers, with end portions thereof as the fulcrum, by causing said flexible rod to expand through the actuation of said cylinder.

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**4,298,148**

## HAND DEVICE FOR MAKING A BIAS TAPE

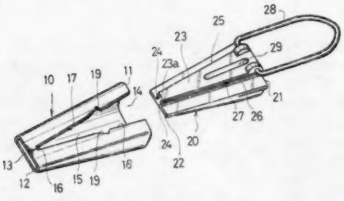
**Yoshiaki Gakiya, Habikino, Japan, assignor to Clover Mfg. Co., Ltd., Osaka, Japan**

**Filed Jan. 7, 1980, Ser. No. 110,213**

**Claims priority, application Japan, Mar. 16, 1979, 54-34622[U]**

**Int. Cl.³ A41H *33/00***

**U.S. Cl. 223—37** **5 Claims**




1. A hand device for making a bias tape comprising:

an outer tubular member made of metallic sheet material and having a substantially oval rear end opening and a slit-shaped front end opening;

said outer tubular member being gradually reduced or tapered from its rear end toward its front end;

said outer tubular member having a top opening of a substantially triangular shape defined by a vertex positioned near said front end and a pair of sides divergently extending from said vertex;

an internal solid member made of synthetic resin material and being gradually reduced or tapered from its rear end toward its front end at its top side so as to be exposed out of said top opening;

said platform having a pair of said walls engaged with said pair of sides, respectively;

said outer tubular member and said internal solid member being assembled together by inserting the latter into the former;

a tape-folding passage formed between an internal wall of said outer tubular member and an external wall of said internal solid member; and

said passage having a substantially U-shaped configuration in cross section at its rear end and being gradually changed in its configuration so as to provide a substantially flat annular configuration in cross section at its front end.

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**4,298,149**

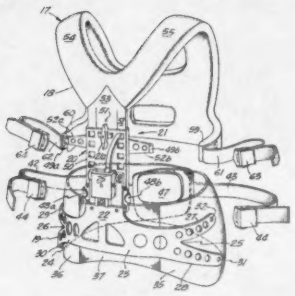
## BODY HARNESS FOR CINEMATOGRAPHER

**Robert E. Gottschalk, Los Angeles, and Felipe Navarro, Granada Hills, both of Calif., assignors to Panavision, Incorporated, Tarzana, Calif.**

**Continuation of Ser. No. 870,132, Jan. 17, 1978, abandoned. This application Dec. 13, 1979, Ser. No. 103,047**

**Int. Cl.³ G03B *17/00***

**U.S. Cl. 224—201** **7 Claims**



1. In a body harness for carrying a camera assembly, the combination of a shoulder member and a hip member, said shoulder member comprising a central plate having connected thereto a pair of support members, said support members having a configuration conforming to the shoulders of a camera operator, said support members being connected to a transverse member having a pair of straps attached thereto and fastenable to the central plate, said hip member comprising a rigid frame, extending from the front of the cameraman to approximate with his hips, said frame having connected thereto a resilient padding extending from one hip of the cameraman to the other across the front of the body, said resilient padding having a fastening means whereby said resilient padding may be firmly tightened about the hips of said cameraman.

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**4,298,150**

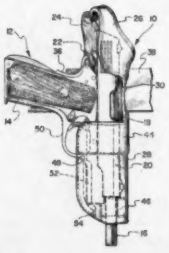
## PISTOL CHARGING HOLSTER

**Richard Seldeen, 222 Ramona Pl., Camarillo, Calif. 93010**

**Filed Aug. 21, 1980, Ser. No. 180,041**

**Int. Cl.³ F41C *33/02***

**U.S. Cl. 224—243** **7 Claims**



1. In combination with a pistol which has a barrel through which a round is to pass from the firing chamber, said pistol having a trigger assembly, said pistol having a slide located

about said barrel, said slide having an outermost end, said slide to be movable in respect to said barrel between a first position and a second position, with said slide in said first position the said barrel is confined within said slide, with said slide in said second position the said barrel is extended outwardly from said outermost end of said slide, movement of said slide from said first position to said second position causes charging of said pistol and upon return of said slide to said first position a round is to be located within said firing chamber, the improvement comprising a holster to facilitate charging of said pistol:

a holster housing having a fore end and an aft end, said fore end being formed into a sheath having a fixed sidewall forming an open ended encasing chamber, said encasing chamber having an inlet opening and an outlet opening, said outlet opening connecting with a recessed area open to the ambient, said firing chamber located within said recessed area, said slide to extend through said inlet opening and be located within said encasing chamber with said sheath located in a close fitting arrangement about said slide; and

means included within said encasing chamber, said means being attached to said sheath, said means to engage with said outermost end of said slide and fixedly position said slide in respect to said sheath during movement of said barrel to be outwardly extended in respect to said outermost end of said slide, said means comprising a protuberance protruding into said encasing chamber, said protuberance being located directly adjacent said outlet opening.

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**4,298,151**

## CARRIER RACK

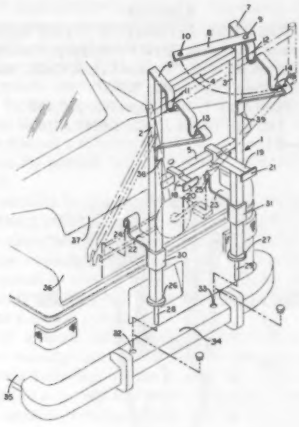
**Brian J. O'Connor, 1123 Marine Ave., Santa Monica, Calif. 90405**

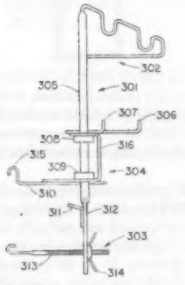
**Continuation-in-part of Ser. No. 894,124, Apr. 6, 1978, which is a continuation-in-part of Ser. No. 774,522, Mar. 4, 1977. This application Apr. 2, 1980, Ser. No. 136,417**

**Int. Cl.³ B60R** *9/10*

**U.S. Cl. 224—329** **20 Claims**

1. Rack means for mounting at least one two-wheeled vehicle having a substantially triangular-shaped frame on an engine-powered vehicle comprising a frame, first support means slidably joined to and projecting from one side of said frame, second support means slidably joined to and projecting farther than said first support means from said one side of the frame, third support means joined to and projecting from said one side of the frame, said third support means including means for receiving and supporting the horizontal member of said substantially triangular-shaped frame of at least one two-wheeled vehicle, fourth support means joined to and projecting from said one side of the frame, said fourth support means including means for receiving and supporting the horizontal member of said substantially triangular-shaped frame of at least one two-wheeled vehicle, said receiving and supporting means lying at least partly along a common line, each of said third and fourth support means forming an angle with respect to said frame in the range of about 35° to about 85°, means joined to and projecting from the second side of said frame for being releasably secured between an opening in said engine-powered vehicle and closure means appended to said opening, and seating






means joined to said frame and shaped to join said frame to said engine-powered vehicle.

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**4,298,152**

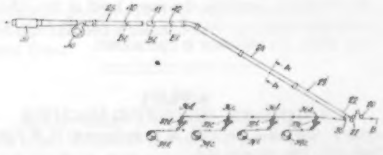
## ACCUMULATOR FOR TENUOUS MATERIAL

**Robert C. Austin, Deerfield, Ohio, assignor to Weld-Loc Systems, Inc., Alliance, Ohio**

**Filed Aug. 4, 1980, Ser. No. 156,471**

**Int. Cl.³ B65H** *17/28*

**U.S. Cl. 226—95** **11 Claims**



1. An accumulator for storing plastic strapping band and being adapted for use in conjunction with a line for processing plastic material into band form, said accumulator comprising,

an elongated tube having an inlet disposed adjacent to the exit end of said processing line at which end said band is in form for passage to a winding mechanism, and

means creating a rush of air into said inlet end, through said

tube and outwardly from an exit end thereof, the inrush of air sucking the band in loop form into said tube.

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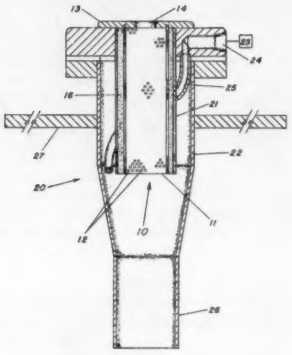
**4,298,153**

## INTERFLOOR TUBE ASPIRATOR INLET MUFFLER

**Wilbur L. Stables, Matoaca; David Pendlebury, Chester, both of Va., and William R. Weiss, Walnut Creek, Calif., assignors to Allied Corporation, New York, N.Y.**

**Filed May 7, 1980, Ser. No. 147,439**
**Int. Cl.³ B65H *17/32*; D02G *1/16***
**U.S. Cl. 226—97** **4 Claims**



1. A muffler for use in conjunction with an interfloor tube and aspirator during the production of multifilament synthetic yarn wherein the interfloor tube comprises a tube and a yarn inlet passage which extends into the tube, the muffler comprising:

a. a perforated second tube having an outside diameter which is smaller than the inside diameter of the yarn inlet passage, the perforated second tube having a plurality of perforations which create an open area for the perforated second tube of from 35 to 95 percent, the length of the perforated second tube being essentially coextensive with the yarn inlet passage;

b. a restrictor plate, mounted so as to cover the entrance to the yarn inlet passage, the perforated second tube being mounted at one end to the restrictor plate so as to be within the yarn inlet passage and define an annular chamber therebetween, the restrictor plate having an opening communicating with the opening of the perforated second tube, the smallest dimension of the opening of the restrictor plate beirg at least about 0.1875 inch (0.4763 cm.) at yarn extrusion rates of up to 50 pounds per hour per position and at least about 0.5000 inch (1.27 cms.) at yarn extrusion rates of about 51 to 160 pounds per hour per position; and

c. sound absorbing material, disposed throughout the annular chamber; whereby the noise level at the inlet of the interfloor tube is reduced by up to 10ΔdB(A) by the muffler when the aspirator is operational.

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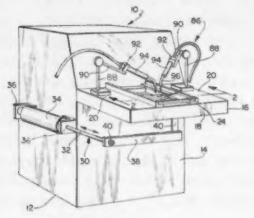
**4,298,154**

## AUTOMATIC SOLDERING MACHINE

**Douglas F. DeFusco, Warwick, R.I., assignor to B. B. Greenberg Company, Providence, R.I.**

**Filed Jan. 14, 1980, Ser. No. 112,074**
**Int. Cl.³ B23K *37/04***
**U.S. Cl. 228—49 R** **8 Claims**

1. Automatic soldering apparatus for soldering components of an elongated jewelry article such as the adjacent ends of split jump rings utilized to connect chain to opposite sides of an ornament and to a spring ring wherein it is desirable to avoid adversely thermally contacting those portions of the jewelry article disposed adjacent the ends being soldered comprising, a frame including longitudinally directed laterally spaced guides, a heat resistant fixture disposed between said guides, said fixture adapted for longitudinal movement relative to said frame and having a generally planar upper face in which at least one laterally extending article-receiving groove is disposed for receipt of said jewelry article to a fixed position relative to said



fixture, at least one longitudinally oriented groove intersecting said lateral groove, said groove intersection adapted to receive one of said split rings to be soldered, heating means mounted on said frame for directing a narrow, high temperature flame jet into said longitudinal groove and means for longitudinally moving said fixture relative to said frame, whereby said split ring is momentarily contacted by said flame jet during movement of said fixture relative to said jet.

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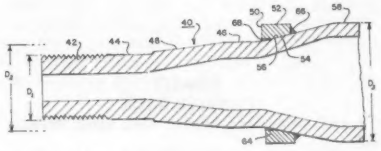
**4,298,155**

## METHOD FOR MAKING AN AXLE SPINDLE

**John Palovcik, Kenton, Ohio, assignor to Rockwell International Corporation, Pittsburgh, Pa.**

**Continuation of Ser. No. 62,714, Aug. 1, 1979, abandoned. This application Nov. 3, 1980, Ser. No. 202,912**
**Int. Cl.³ B23K *31/02***
**U.S. Cl. 228—114** **17 Claims**

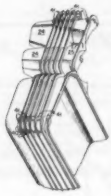


1. A method of forming a spindle for an axle capable of supporting a vehicle wheel rotatably mounted thereon, said method comprising: providing a hollow tubular blank having a central axis, a generally uniform external diameter and wall thickness and a first open end; reducing said tubular blank at a first region thereof concentric with said central axis adjacent said first end to provide a first diameter therefor and a second region thereof concentric with said central axis remote from said first end to provide a second diameter which is greater than said first diameter and less than said external diameter; forming a first transition area between said first region and said second region and a second transition area having a generally frusto-conical outer surface between said second region and a portion of said tubular blank which is free of said reducing and remote from said first end; providing a collar having a minimum inner diameter greater than said second diameter for limited clearance therebetween and including a frusto-conical inner surface widening from said minimum inner diameter to match the taper of said second transition area, said collar having a radial surface at said minimum inner diameter which is generally perpendicular to an axis of said collar; mounting said collar on said second transition area; and securing said collar to said second transition area.

## 4,298,156
## NESTABLE AND DENESTABLE MOLDED EGG CARTONS

**Richard F. Reifers, New Canaan, Conn., and Henry A. Lord, Cape Elizabeth, Me., assignors to Diamond International Corporation, New York, N.Y.**

**Filed Jun. 20, 1980, Ser. No. 161,621**
**Int. Cl.³ B65D *21/02***
**U.S. Cl. 229—2.5 R** **6 Claims**



1. In an open, nestable molded egg carton having an inverted dished four-cornered rectangular cover section hingedly connected to a four-cornered rectangular cellular section and wherein each of said sections has two relatively long tapered sides and two relatively short tapered ends and wherein the inside corners of said sections are adjacent their hinged connection and the outside corners are at the outer margins of the molded egg carton, a denestable structural formation comprising

(a) a hollow first separating ledge located on and around each outside corner,

(b) hollow discrete second separating ledges located entirely in said end walls substantially immediately adjacent said first separating ledges,

(c) said second separating ledge being located outwardly from the center of said end walls,

(d) the inner surface portion of said sections between said first and second ledges being substantially, or relatively, unbroken and generally continuous in a generally vertical direction.

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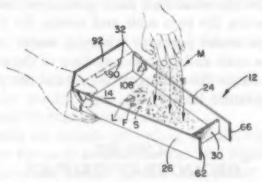
## 4,298,157
## SEPARATOR AND STORAGE BOX

**Richard A. DeVierno, 9508 E. Bexhill Dr., Kensington, Md. 20795**

**Filed Dec. 11, 1979, Ser. No. 102,615**
**Int. Cl.³ B65D *85/30, 5/26***
**U.S. Cl. 229—35** **1 Claim**



1. An integral foldable blank comprising:

a trapezoidal body having non-parallel side edges and parallel end edges;

a first rectangular end panel having a pair of end edges and a pair of side edges and being foldably attached to one of said body end edges by a foldline defined along one of said first end panel end edges;

a second rectangular end panel having a pair of end edges and a pair of side edges and being foldably attached to another of said body end edges by a foldline defined along one of said end panel side edges, said second end panel being larger than said first end panel and having an open rectangular slot defined therein on another second end panel side edge, said slot having a length larger than the length of said first end panel so that said first end panel can be accommodated therein;

a pair of equal sized polygonal side panels each having a pair of end edges and a pair of side edges and each being foldably attached to one of said body side edges by a foldline defined along one of said panel side edges, said side panels converging toward said first end panel and each having an arcuate slot defined therein adjacent one of said side panel end edges, each of said slots having one end adjacent a foldline and having another end oriented essentially parallel with another of said side panel side edges;

a third end flap having a pair of parallel side edges integrally and being attached to said another second end panel side edge along one of said third end flap parallel side edges;

a foldline extending transversely across said body and said side panels so said body and said side panels can be folded to insert said first end panel into said rectangular slot to define a closed pouch; and

a pair of tongues each foldably attached to a second end panel end edge near one of said arcuate slots, each of said tongues including a base having one edge foldably attached to a second end panel end edge, a pair of parallel side edges each being colinear with said first end panel end edges and an arcuate tongue tab on another edge thereof, said tongue tabs extending outwardly from said bases and being colinear with each other.

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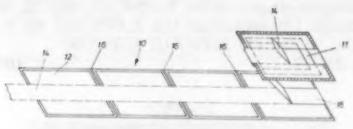
## 4,298,158
## PACKAGING ELEMENT FOR PACKAGING SHEET MATERIAL

**Joachim Hoppe, and Yahya Haghiri-Tehrani, both of Munich, Fed. Rep. of Germany, assignors to GAO Gesellschaft für Automation und Organisation mbH, Munich, Fed. Rep. of Germany**

**Filed Mar. 12, 1980, Ser. No. 129,567**
**Claims priority, application Fed. Rep. of Germany, Mar. 13, 1979, 2909834**
**Int. Cl.³ B65D *27/10***
**U.S. Cl. 229—69** **9 Claims**



1. The packaging element for packaging sheet material such as banknotes, consisting of a plurality of envelopes for receiving the sheet material, said envelopes being arranged in succession and having their undersides separably attached to an auxiliary belt between the leading edge and the center of gravity, characterized in that the auxiliary belt is formed of at least one continuous tear-off strip (14) which is an integral part of the envelopes (12) and is adapted to be separated therefrom by perforated lines.

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## 4,298,159
## SOLID SLEEVE WORM CENTRIFUGE

**Wolfgang Epper, Bergheim-Zievenich, and Wolfgang Heckman, Bergisch-Gladbach, both of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany**

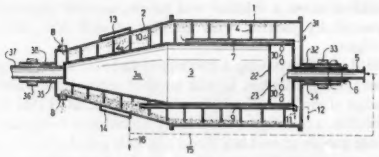
**Filed Mar. 19, 1979, Ser. No. 21,693**
**Claims priority, application Fed. Rep. of Germany, Mar. 25, 1978, 2813140**
**Int. Cl.³ B04B *1/20***
**U.S. Cl. 233—7** **11 Claims**

1. A solid sleeve worm centrifuge for the separation of solids and liquid in a solid-liquid mixture comprising:

a cylindrical portion for the separation of said mixture;

a conical portion for the discharge of separated solids, said conical portion attached in coaxially alignment with said cylindrical portion;

a conveyor worm having a cylindrical worm body portion which begins to taper in a transition region to form a conical worm body portion at one end thereof, and which is rotatable inside said centrifuge for moving solids to be discharged through said centrifuge;



a static plate mounted on said worm conveyor in said transition region; and

a liquid withdrawal means which communicates with an interior of said conical portion of said centrifuge at a location behind said static plate in the direction of flow through said centrifuge for removing liquid from solids in said conical portion.

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**4,298,160**

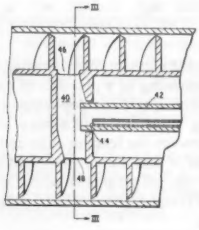
## SOLID BOWL DECANTER CENTRIFUGES

**Joseph F. Jackson, Halifax, England, assignor to Thomas Broadbent & Sons Limited, Huddersfield, England**

**Continuation-in-part of Ser. No. 908,437, May 22, 1978, abandoned. This application Aug. 3, 1979, Ser. No. 63,651**

**Int. Cl.³ B04B** *1/00, 3/00, 5/00*

**U.S. Cl. 233—7** **10 Claims**



1. A method of centrifuging comprising the steps of rotating a bowl decanter at a first speed; rotating a scroll conveyor within the bowl at a second, slightly different speed for conveying separated solids to a solids discharge end of the bowl; introducing the suspension to be centrifuged into a feed compartment formed in a hub portion of the scroll conveyor; introducing a flocculating additive to the feed compartment substantially separate from the suspension; mixing said suspension and flocculating additive within said feed compartment; and delivering said mixed suspension and flocculating additive from the feed compartment to the bowl before substantial flocs have been formed.

**4,298,161**

## CENTRIFUGE

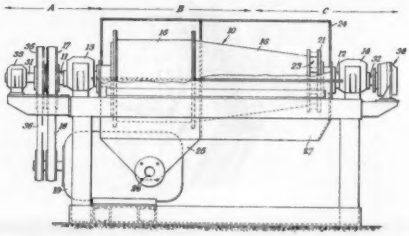
**Henry J. Ephithite, Camberley, England, assignor to Wilkinson Rubber Linatex Limited, Surrey, England**

**Filed Oct. 18, 1979, Ser. No. 85,989**

**Claims priority, application United Kingdom, Oct. 23, 1978, 41556/78**

**Int. Cl.³ B04B** *1/20, 11/00*

**U.S. Cl. 233—7** **20 Claims**



1. A centrifuge for separating a solids-liquid mixture comprising a rotatable drum having an inner surface of revolution about the rotary axis of the drum, a solids discharge outlet at one end of the drum and a liquid discharge outlet at the other end of the drum, means for feeding the solids-liquid mixture to a region adjacent the inner surface of the drum and a solids material conveyer arranged within the drum for rotation about the rotary axis of the drum at a speed slightly different from the speed of rotation of the drum and having a distal working surface formed about the rotary axis adjacent the inner surface of the drum and adapted to engage liquid-reduced solids material during rotation of the drum and the conveyer to convey it to the solids discharge outlet, while solids-reduced liquid discharges at the liquid discharge outlet at the other end of the drum, the distal working surface being provided at least in part by wear-resistant rubber material, and the means for feeding the solids-liquid mixture to the inner surface of the drum comprising a feed duct having an axial feed duct portion rotatable with the conveyer and extending along the rotary axis of the conveyer to an open end located outside the drum, wherein the open end of the axial feed duct portion communicates with a non-rotatable feed inlet which includes two non-rotatable annular seals of a wear-resistant rubber material surrounding the rotatable axial feed duct portion and engaging the outer surface thereof at axially spaced locations therealong adjacent the open end of the axial feed duct portion to form an annular chamber between the two seals and means for feeding to the chamber water under pressure whereby water seeps between the ends of the seals and the outer surface of the axial feed duct portion to lubricate the seals and to prevent the passage of the solids-liquid mixture beneath the seals.

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**4,298,162**

## DECANTER CENTRIFUGE

**Per Hohne, Valby, Denmark, assignor to Alfa-Laval Separation A/S, Soborg, Denmark**

**Filed Jan. 25, 1980, Ser. No. 115,170**

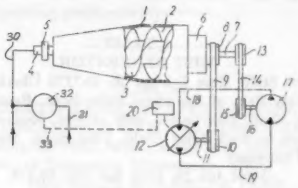
**Claims priority, application Denmark, Feb. 23, 1979, 806/79**

**Int. Cl.³ B04B** *1/20*

**U.S. Cl. 233—7** **6 Claims**

1. A decanter centrifuge comprising a motor-driven rotary drum, a conveyor screw located within said drum and rotatable relative thereto for conveying solid material separated from a raw material supplied to the drum, a mechanical gearing connecting said drum and said conveyor screw, said gearing including a housing rigidly connected to said drum and an input shaft the rpm. of which determines the rpm. of the screw relative to the drum, a first positive displacement type hydraulic machine having a constant displacement volume, a second

positive displacement type hydraulic machine having a variable displacement volume, first power transmitting means connecting one of said first and second hydraulic machines with the housing of said gearing, second power transmitting



means connecting the other of said hydraulic machines with the input shaft of said gearing, and conduit means connecting said first and second hydraulic machines in a closed hydraulic circuit.

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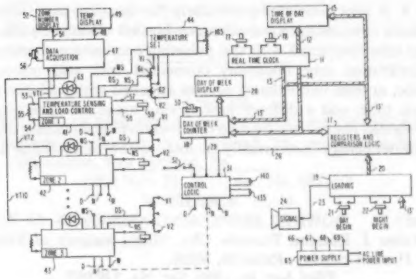
**4,298,163**

## ELECTRONIC MULTI-ZONE TIMED TEMPERATURE CONTROL APPARATUS

**John G. Richardson, Idaho Falls, and Robert W. Soldat, Shelley, both of Id., assignors to Envirotronics, Phoenix, Ariz.**

**Filed Oct. 3, 1979, Ser. No. 81,571**
**Int. Cl.³ F23N *5/20*; G05D *23/00***
**U.S. Cl. 236—46 R** **28 Claims**



1. Timed temperature control apparatus for a zone comprising:

clock means producing time output over a repetitive time cycle;

time display means responsive to said time output to display current time;

digital logic circuit means responsive to said timed output alternately producing a day mode status output and a night mode status output;

a temperature set means providing a different temperature set output for each said day modes and night modes, each temperature set being variable and preset to a selected temperature for that mode;

temperature sensing and load control means including a sensing circuit portion having input terminals to which a temperature sensor for the zone is connected, each said sensing circuit portion having switching means responsive to said day and night mode status outputs from said temperature set outputs from said temperature set means to establish a set temperature for each mode, said temperature sensing and load control means including a load control portion with a comparator for comparing the relative magnitudes of the sensed temperature output and coupled to output terminals to which a load device for the zone is connected whereby to continuously measure the temperature in said zone during the day and during the night to actuate a load control device when the temperature drops below or goes above a selected temperature setting; and

temperature display means responsive to the temperature sensed output of said sensing circuit portion to display the temperature of the zone, said temperature sensor being a resistance-type RTD platinum film.

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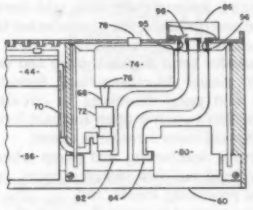
**4,298,164**

## AIR CONDITIONING SYSTEM AND CONTROL THEREFOR

**John E. Post, Cincinnati, Ohio, assignor to Carrier Corporation, Syracuse, N.Y.**

**Division of Ser. No. 53,599, Jun. 29, 1979, Pat. No. 4,238,071.**
**This application May 5, 1980, Ser. No. 146,890**
**Int. Cl.³ F24F *11/04***
**U.S. Cl. 236—49** **5 Claims**



1. A method for controlling the amount of air supplied to a plurality of zones comprising the steps of:

sensing the temperatures of the zones;

directly varying the amount of air supplied to the zones in response to changes in the air temperature thereof;

sensing the temperature of the air supplied to the zones;

increasing the amount of air supplied to a first preselected zone in response to the temperature of the supplied air rising above a predetermined value indicating the start of a warm-up period; and

substantially restricting the amount of air supplied to a second preselected zone in response to the temperature of the supplied air rising above in predetermined value to decrease the amount of air entering the second zone during the warm-up period to prevent overheating thereof.

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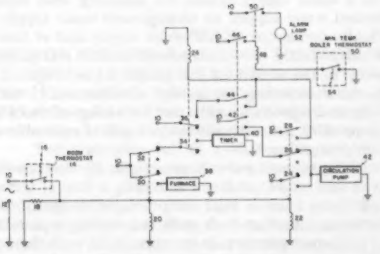
**4,298,165**

## CONTROLS FOR HEATING SYSTEM

**Milton A. McKinley, Palisades Park, N.J., assignor to Surgeonics Limited, Mount Kisco, N.Y.**

**Filed Dec. 28, 1979, Ser. No. 108,133**
**Int. Cl.³ F24D *3/00***
**U.S. Cl. 237—8 R** **6 Claims**



1. For use in a heating system obtaining electrical energy from a suitable source wherein an enclosed region is heated by hot water flowing through a heat exchanger disposed in the

region, the hot water being supplied from a boiler heated by a furnace which is electrically actuated and deactuated, the water being circulated between the boiler and the heat exchanger by a circulator pump which is electrically actuated and deactuated, a thermostat being disposed in the space to control the temperature therein and including a first electrical switch which is closed when additional heat must be supplied to the region and which is otherwise open, apparatus comprising:

a minimum temperature thermostat for said boiler connected in circuit with the furnace to maintain the temperature of the water in the boiler at a selected minimum temperature, the minimum thermostat including a second electrical switch which is closed when the temperature of the boiler water is below said minimum and which is otherwise open;

first means for actuating said furnace and said pump when said first switch is closed and for deactuating the furnace and the pump when the first switch is open;

a timer which is automatically reset, said timer when electrically actuated operating for a preselected time period and then is automatically deactuated;

second means for actuating said pump and said timer when said first means deactuates said furnace and pump, whereby said pump continues to circulate said water when said first switch is open and said furnace is deactuated while said timer remains actuated;

third means for deactuating said pump when said timer is deactuated and said first switch is open;

alarm signal producing means; and

a comparator coupled between the timer, the second switch and the alarm means to energize the alarm means when the timer is actuated and at the same time the second switch is closed.

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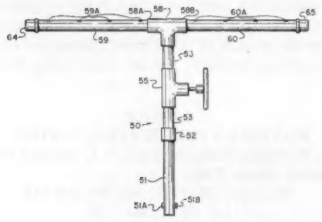
**4,298,166**

## PORTABLE WATER DRINKING FOUNTAIN

**Joe I. White, 7709 Byrum Dr., and Elton G. Hawley, 1426 Springwood La., both of Charlotte, N.C. 28210**

**Filed Nov. 8, 1978, Ser. No. 958,551**
**Int. Cl.³ E03B 9/20**
**U.S. Cl. 239—24** **1 Claim**




1. In a water supply system for irrigating land, having a pressurized water supply, an underground water supply conduit fluidly connected to said water supply and at least one outlet valve fluidly connected to said conduit and projecting upwardly to the surface of the ground to be irrigated, said outlet valve including means for simultaneously matingly receiving an irrigation sprinkler and activating a flow of water to said sprinkler, the combination therewith of a portable water fountain comprising:

a. coupling means for simultaneously fluidly interconnecting with said outlet valve and activating a flow of water;

b. a drinking fountain head comprising an elongated tubular member, closed at both ends and having a plurality of spaced-apart apertures in the upper axial walls thereof for providing a plurality of upwardly directed streams of water for drinking; and

c. an upright tubular leg fluidly interconnecting said drinking fountain head to said coupling means at a position perpendicular thereto and intermediate its close ends for supplying water to said fountain head and supporting said fountain head in vertically spaced relation above the ground, said tubular leg including valve means for regulating the flow of water to said fountain head.

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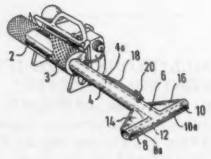
**4,298,167**

## MIST GENERATOR

**Karl-Heinz Stahl, Zum Felchen 20, D-7770 Überlingen, Nussdorf, Fed. Rep. of Germany; Fritz Fend, Regensburg, and Werner Stahl, Überlingen, both of Fed. Rep. of Germany, assignors to Karl-Heinz Stahl, Überlingen, Nussdorf, Fed. Rep. of Germany**

**Filed Jul. 26, 1979, Ser. No. 60,778**
**Claims priority, application Fed. Rep. of Germany, Aug. 11, 1978, 2835338**
**Int. Cl.³ A01M 7/00**
**U.S. Cl. 239—129** **7 Claims**




1. A mist generator particularly for spraying pesticides on plants comprising: a pulsating combustion chamber; a resonator tube connected with said pulsating combustion chamber; a distribution tube releasably connected with said resonator tube; at least two exhaust nozzles attached with said distribution tube; and a diffuser tube having branched ends pieces; with said resonator tube, said distribution tube and said exhaust nozzles being concentrically enclosed within said diffuser tube.

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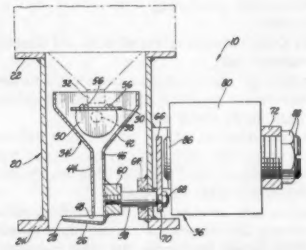
**4,298,168**

## POWDER DISPENSING ASSEMBLY

**Walter J. Rozmus, Traverse City, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.**

**Filed Apr. 14, 1980, Ser. No. 139,907**
**Int. Cl.³ A01C 3/06**
**U.S. Cl. 239—659** **16 Claims**




1. A powder dispensing assembly (10) comprising; support structure (20), a dispensing platform (26) supported by said support structure (20) for receiving powder and having a distal lip (28) over which particles of powder move to define a falling curtain of powder particles, a supply platform (30) supported by said support structure (20) for receiving powder and supplying the powder to said dispensing platform (26), flow control means (34) for establishing a flow path of the powder from said supply platform (30) to said dispensing platform (26), said

assembly characterized by drive means (36) for vibrating said dispensing platform (26) to move particles thereover and over said lip (28) and for moving said supply platform (30) in unison with said dispensing platform (26) to move powder from said supply platform (30) and through said flow control means (34) to said dispensing platform (26).

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4,298,169

## SELECTIVE FLOCCULATION, MAGNETIC SEPARATION, AND FLOTATION OF ORES

Iwao Iwasaki, St. Paul, Minn., assignor to The Regents of the University of Minnesota, Minneapolis, Minn.

Filed Sep. 26, 1979, Ser. No. 79,074
Int. Cl.[3] B02C *23/18*
U.S. Cl. 241—16 13 Claims

1. A method of concentrating low-grade ores containing residual magnetite, which method comprises:

(A) mixing said ore with water and grinding to a fineness sufficient to substantially liberate the desired mineral values in said ore,

(B) mixing said finely divided ore, containing magnetite, with a flocculating material selected from the class consisting of carbohydrate and synthetic polymerized flocculating agents to induce selective flocculation of the desired mineral on nuclei of ore particles containing residual magnetite,

(C) subjecting said flocculated mineral to magnetic separation,

(D) recovering the flocs of mineral, and

(E) discarding the non-magnetic gangue.

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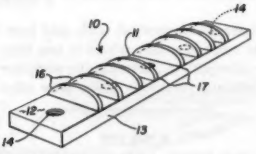
4,298,170

## SHEAR BAR FOR FORAGE HARVESTERS OR THE LIKE

Benjamin H. Snavely, New Holland, Pa., assignor to Sperry Corporation, New Holland, Pa.

Filed Nov. 21, 1977, Ser. No. 853,379
Int. Cl.[3] B02C *18/16*
U.S. Cl. 241—222 5 Claims




1. In a forage harvester having a rotatable cutterhead, a shear bar arranged to cooperate with the cutterhead to reduce crop materials to substantially uniform lengths, an infeed mechanism to direct a mat of crop material across the shear bar into engagement with the cutterhead, an improved shear bar comprising:

a substantially rectangular plate like base having a top surface with length and width dimension, an opposing bottom surface, and first and second opposing shear surfaces extending the full length dimension perpendicular to said top and bottom surfaces; and

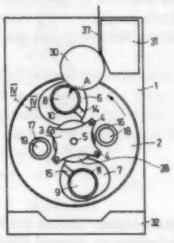
a plurality of fixed substantially identical projections extending from said top surface of said base in a direction opposite said bottom surface, said projections spaced apart along the length of said base and each having a primary dimension substantially parallel and equal to the width of said base, whereby each projection extends across said top surface between said first and second shear surfaces.

4,298,171

## WINDING APPARATUS FOR ENDLESS FILAMENTS HAVING AN AUTOMATIC BOBBIN TUBE CHANGER

Peter Flückiger, and Kurt Schefer, both of Winterthur, Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland

Continuation of Ser. No. 945,330, Sep. 25, 1978, abandoned. This application Mar. 12, 1980, Ser. No. 129,625
Claims priority, application Switzerland, Sep. 23, 1977, 11627/77
Int. Cl.[3] B65H *54/02, 54/42, 67/04*
U.S. Cl. 242—18 A 25 Claims




1. A winding apparatus for endless filaments comprising

a friction drive drum;

a rotatable disc having at least two apertures therein;

a pair of bobbin chucks, each said chuck capable of receiving at least one bobbin tube thereon and being aligned with and passing through a respective aperture in said disc;

an accelerating ring disposed concentrically of said discs, said ring having a diameter to project into the plane range of said apertures;

means for rotating said ring independently of said disc;

means for pivoting said disc through a predetermined arc for alternately placing said bobbin chucks in position for said bobbin tubes thereon to be engaged by said drive drum for winding endless filaments;

means mounted on said disc for moving each said bobbin chuck axially with respect to said disc between a working position wherein the bobbin tube received on a respective bobbin chuck is axially spaced from a plane containing said accelerating ring and a retracted position wherein the bobbin tube received on a respective bobbin chuck is located in a plane containing said accelerating ring; and

means for pivoting each bobbin chuck about an axis parallel to and radially offset from said accelerating ring to position a bobbin tube received on one of said chucks in contact with said accelerating ring when said one bobbin chuck is in said retracted position and to position a bobbin tube received on the other of said chucks in contact with said drive drum when said other bobbin chuck is in said working position.

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4,298,172

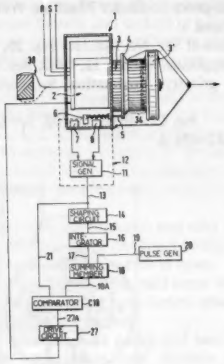
## METHOD AND APPARATUS FOR CONTROLLING A THREAD STORAGE AND FEEDER DEVICE

Jerker Hellstrom, Nol, Sweden, assignor to Aktiebolaget IRO, Ulriceham and Aros Electronics AB, Askim, both of, Sweden

Continuation of Ser. No. 960,624, Nov. 14, 1978, abandoned. This application Jul. 18, 1980, Ser. No. 169,991
Claims priority, application Sweden, Nov. 14, 1977, 7712808
Int. Cl.[3] B65H *51/20*
U.S. Cl. 242—47.01 13 Claims

1. A method for controlling the rotational speed of a winding member of a thread storage and feeding device for a thread processing machine which includes a thread storage drum for intermediate storage of thread from a supply bobbin and an electric motor for rotating said winding member, comprising the steps of: detecting the amount of the thread supply on said

thread drum and providing an electric signal related thereto; providing an electric signal representative of the average rate of consumption of thread from said drum; combining both of




said electric signals to provide an electric control signal; and using said control signal to control the rotational speed of said motor.

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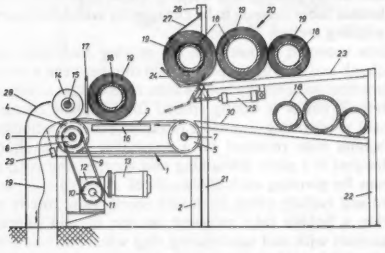
**4,298,173**

**APPARATUS FOR UNWINDING OF A MATERIAL WEB**

**Kjell A. I. Johansson, Styrmansgatan 19, 311 00 Falkenberg, Sweden**

**Filed Aug. 12, 1980, Ser. No. 177,693**
**Claims priority, application Sweden, Aug. 16, 1979, 7906848**
**Int. Cl.³ B65H** *19/08, 75/02*
**U.S. Cl. 242—58** **5 Claims**



**1**. An apparatus for unwinding a material web, for example a paper web, which is wound up onto a core, for example a paper core, characterised in that a device is disposed to support the core with the material web and to rotate the core with the material web during retention of the core with the material web in a position during unwinding of the material web; and that first means are provided to discontinue the rotation when the core is empty, whereupon the core rolls away from said apparatus because of its own rotation.

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**4,298,174**

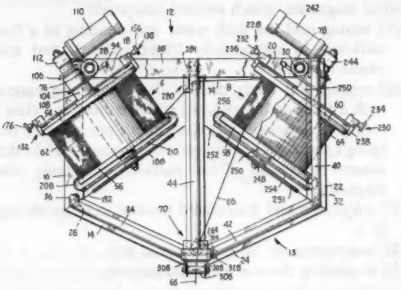
**WIRE TAKE-OFF DEVICE**

**Joseph J. Kovaleski, Easton, Conn., assignor to Wyrepak Industries, Inc., Bridgeport, Conn.**

**Filed May 21, 1980, Ser. No. 151,943**
**Int. Cl.³ B65H** *49/00*
**U.S. Cl. 242—128** **31 Claims**

**20**. An apparatus for de-reeling wire from multiple wire-carrying spools in succession and without interruption, comprising in combination:

(a) a pair of spools,
(b) means for supporting the spools with one end of each spool being free, the axis of each spool generally converging toward a guide area,
(c) a wire guide disposed at said guide area,
(d) means mounting said guide for swiveling movement about an axis askew with respect to those of the two spools, such that the guide can swing between a first position facing the free end of one of the spools, and a second position facing the free end of the other of said spools, as one spool becomes depleted and de-reeling from the other spool commences,
(e) means providing a rotatable hub at the said end of one of the spools,
(f) a freely-mounted take-off wheel located at the said free end,



(g) a plurality of substantially radially disposed, flexible and slender spoke-like, wire-restraining tines fixedly supported at their adjoining inner ends on said hub, said tines extending past the periphery of the wheel, the outer end portions of said tines yielding to and being shifted peripherally by the unreeling strand of wire, said wire strand being thereby restrained from wholly free travel around the periphery of the one spool end, and being prevented from freely unwinding around the one spool end and kinking during slow wire speeds or halting of the wire, and
(h) powered means connected with said hub for rotatably driving the same at a rate which is less than the speed at which the wire strand traverses the periphery of said one spool end, during relatively faster wire take-off speeds.

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**4,298,175**

**AIRPLANE WING AND UNDERCARRIAGE CONSTRUCTION**

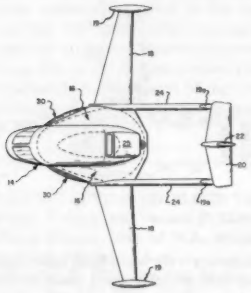
**T. Desmond Earl, Buffalo, N.Y., assignor to Textron Inc., Providence, R.I.**

**Filed Mar. 21, 1979, Ser. No. 22,527**
**Int. Cl.³ B64C** *1/00;* **B60Y** *3/08*
**U.S. Cl. 244—13** **5 Claims**

**1**. An amphibious airplane having an inflatable trunk type air cushion confining undercarriage thereunder;
said airplane having a watertight fuselage and wing structures extending generally laterally thereof and merging therewith in aerodynamically efficient configuration;
said wing structures each comprising an outer wing component and an inner wing component which is three-dimensionally enlarged with respect to its outer wing component and which in frontal and sidewise views merges with said fuselage to provide an enlarged broad base support structure for said undercarriage as well as a smooth and aerodynamically efficient downwardly facing surface formed in part by said fuselage and said inner wing components, said inner wing components extending both forwardly and rearwardly

of their outer wing components but to a greater extent forwardly thereof so that said surface is of egg-shaped planform with the broad end of such shape located behind the wing center line;

said undercarriage comprising an inflatable trunk of generally toroidal configuration formed of elastic sheet material mounted on and generally conforming to the egg-shaped perimeter of said surface; whereby, when said trunk is inflated the center of pressure thereof is disposed forwardly of



the center of aerodynamic lift of said airplane and when the trunk is deflated said sheet material resiliently clings snugly against said surface, the maximum track-width of said trunk when inflated is at least 20% of the total wing span dimension of the airplane, the maximum track-width of said trunk when inflated is at least 60% greater than the metacenter height of the airplane, and the height of the airplane center of gravity from the air cushion support level is no more than 50% of the maximum track-width of said trunk when inflated.

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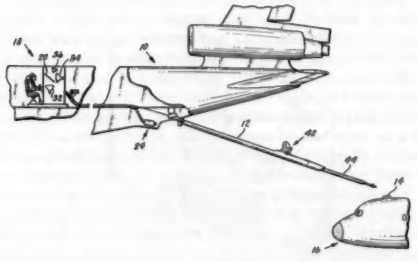
**4,298,176**

## REMOTE REFUELING STATION

**John H. Kendall, Cypress, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.**

**Filed Mar. 1, 1979, Ser. No. 16,368**
**Int. Cl.³ B64D** *39/00*
**U.S. Cl. 244—135 A** **3 Claims**



1. A remote refueling station to control the transferring of fuel from a tanker aircraft to a receiver aircraft by means of a maneuverable extensible refueling boom connected to said tanker aircraft comprising:

a stereoscopic viewing system located in said tanker aircraft comprising a left video camera, a right video camera spacially separated from said left video camera, said cameras directed for observation of said refueling boom and said receiver aircraft, a first video monitor, electrically connected to said left video camera, a first filter to polarize the output image of said first video monitor in a first direction, a second video monitor electrically connected to a said second video camera, a second filter to polarize the output of said second video monitor image in a second direction 90° to the direction of the polarization of said first video monitor, a screen to positionally combine and transmit the images from said first video monitor and said second video monitor, cross-polarized eye glasses to separate the image of said first video monitor from the image of said second video monitor on said screen whereby said boom operator receives the picture from said right video camera in his right eye and from said left video camera in his left eye;

first controller means generating an electric command signal which maneuvers the boom in azimuth and elevation;

second controller means generating an electrical command signal which activates the extensible portion of the boom; and

a third video camera located in the rear of the tanker aircraft and directed to the rear to obtain a view of the approach of the receiver aircraft, and third video monitor electrically connected to said third video camera for viewing the output of the third video camera.

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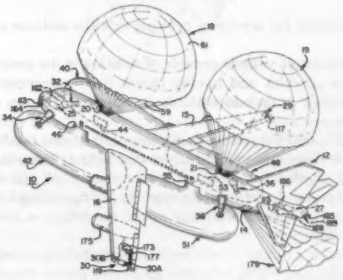
**4,298,177**

## AIRCRAFT SAFETY APPARATUS

**John J. Berlongieri, 14873 Lincoln Ave., Dolton, Ill. 60419**

**Filed Nov. 9, 1979, Ser. No. 92,794**
**Int. Cl.³ B64D** *17/80*
**U.S. Cl. 244—139** **7 Claims**



1. In safety apparatus for use on aircraft to facilitate the in-flight maneuvering thereof to help overcome the malfunctioning thereof, the combination comprising: front parachute means mounted operatively at the front portions of the aircraft for adding to the buoyancy of the aircraft during landings thereof; rear parachute means mounted operatively at the rear portion of the aircraft for adding to the buoyancy of the aircraft during the landing thereof; means for moving said front and rear parachute means into their operating position; a plurality of auxiliary jet propulsion units containing fluid under pressure for propelling the aircraft to aid in its manueverability; port means of at least some of said auxiliary jet propulsion units mounted on the aircraft to direct fluid under pressure laterally away therefrom to cause lateral reaction movement of the aircraft for steering purposes; said means for moving said front and rear parachute means into their operating position includes an ejection assembly, said assembly including a storage compartment for one of said parachute means, the floor of the aircraft having an opening therein, a movable floor door means for covering over the opening in the floor with said storage compartment being stored beneath said floor, means defining an opening in the ceiling of the body of the aircraft, and a movable ceiling door means for covering over the opening in the ceiling, means for raising said compartment from beneath the floor through the opening therein to said opening in said ceiling, and means for ejecting the contents of the compartment through the opening in the ceiling of the aircraft,

wherein said means for ejecting includes parachute ejecting spring means and an electrical solenoid for maintaining said spring means in a retracted position.

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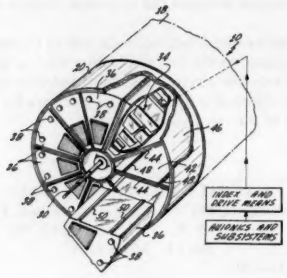
**4,298,178**

## ROVING GEOSYNCHRONOUS ORBIT SATELLITE MAINTENANCE SYSTEM

**Edward J. Hujsak, La Jolla, Calif., assignor to General Dynamics, San Diego, Calif.**

**Filed Jan. 10, 1980, Ser. No. 111,113**
**Int. Cl.³ B64G *1/00, 1/64***
**U.S. Cl. 244—158 R** **4 Claims**




1. A system for servicing orbiting satellite stations comprising,

a maintenance vehicle capable of orbiting in the geosynchronous corridor and having means for rendezvousing and berthing with said satellite on command from another source,

means in said vehicle for replacing parts of said satellite with parts from said vehicle when said vehicle is berthed with said satellite for repair and maintenance of said satellite, said parts of said orbiting satellite are operating hardware packed in modules similar to the module in said orbiting satellite, and

a rotatable circular cradle with said modules located in said cradle, said vehicle further including means for positioning an empty position in said cradle adjacent said orbiting satellite for removing a module to be replaced and rotating said cradle so that a module is juxtaposed the now empty position in the satellite and for ejecting a new module into said satellite.

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**4,298,179**

## VITAL CROSS FIELD TRANSFORMER CIRCUIT ARRANGEMENT FOR RAILROAD SIGNALING SYSTEMS

**Heinz Gilcher, Export, Pa., assignor to American Standard Inc., Swissvale, Pa.**

**Filed May 31, 1979, Ser. No. 44,124**
**Int. Cl.³ B61L *21/06***
**U.S. Cl. 246—34 R** **9 Claims**

1. A vital cross field transformer circuit arrangement, for registering the presence or absence of a selected one of two input signals, comprising,

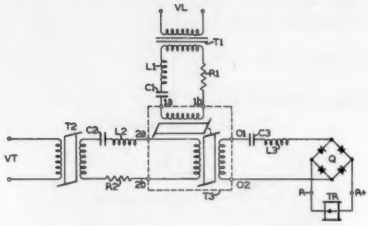
(a) a cross field transformer with interrelated main and modulating magnetic circuits, a primary winding wound on each magnetic circuit, and a secondary winding wound on said main magnetic circuit,

(b) a first input means coupling the modulating primary winding to a first source of alternating current signals of a preselected frequency and operable for supplying only signals of said preselected frequency to the associated winding,

(c) a second input means coupling the main primary winding to a second source of alternating current signals of said preselected frequency and within a predetermined phase relationship to said first source signals,

(1) said second input means operable for supplying only signals of said preselected frequency to said main primary winding,

(d) said cross field transformer responsive to said signals from said first and second input means for producing secondary winding output signals of double said preselected frequency only when both input signals are present and within said predetermined phase relationship,




(e) a registry means normally occupying a first condition and operable to a second condition, and

(f) output means coupled to said secondary winding and responsive only to signals of double said preselected frequency for operating said registry means to its second condition to register the presence of said second source signals.

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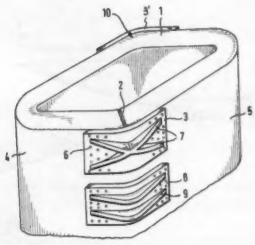
**4,298,180**

## METHOD OF REPAIRING STEELWORKS INGOT MOULDS AND CAST-IRON STEELWORKS INGOT MOULD

**Egon Evertz, Vorlander Strasse 23, 5650 Solingen, Fed. Rep. of Germany, and R. Seybold, Solingen, Fed. Rep. of Germany, assignors to Egon Evertz, Solingen, Fed. Rep. of Germany**

**Filed Jul. 5, 1979, Ser. No. 54,873**
**Claims priority, application Fed. Rep. of Germany, Jul. 5, 1978, 2829448**
**Int. Cl.³ B22D *7/06*; B23P *6/04***
**U.S. Cl. 249—135** **13 Claims**




1. A method of repairing steelworks ingot moulds made of cast iron and having corners in which continuous cracks form, comprising, on appearance of a first longitudinal crack in a wall at a corner of the mould, the steps of securing to the exterior of the mould a series of patching plates in succession in the direction of said longitudinal crack, the plates extending on opposite sides of the crack, likewise securing to the exterior of the mould at the corner diametrically opposite said corner having the crack therein, a second series of patching plates diametrically opposite to the first mentioned patching plates, providing reinforcing ribs which are shaped to match the contour of the mould wall at the corner adjacent said crack

and said diametrically opposite corner, arranging said reinforcing ribs on said first mentioned patching plates substantially transversely to the length of the crack and likewise on said second series of patching plates diametrically opposite said first mentioned patching plates, and subsequently securing said reinforcing ribs to said patching plates.

10. In a steelworks ingot mould of steel-reinforced cast iron having corners and which is reinforced by externally applied patching plates in a corner region having a longitudinal crack therein the improvement comprising a second series of patching plates likewise externally applied to the corner region diametrically opposite the first mentioned corner region and diametrically opposite to the first mentioned plates, externally applied reinforcing ribs on the first mentioned plates disposed substantially transversely to the length of the crack and likewise said second series of plates diametrically opposite to said ribs on the first mentioned plates.

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**4,298,181**

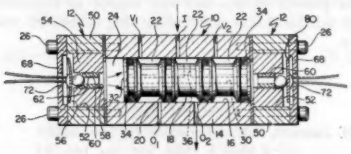
## ELECTRONIC ACTUATED BLEED VALVE

**Anthony P. Corrado, Totowa, and Vincent P. Marchese, Morris Township, Morris County, both of N.J., assignors to EMX Controls, Inc., South Walpole, Mass.**

**Filed Jul. 9, 1979, Ser. No. 56,104**

**Int. Cl.³ F16K *31/02***

**U.S. Cl. 251—129** **2 Claims**



1. A bleed valve assembly including a housing, a bore disposed in said housing, a valve seat mounted in said housing adjacent to and communicating with said bore, a fluid flow orifice terminating at said valve seat, a substantially planar piezoelectric crystal beam mounted within said bore by contact with said bore solely at spaced peripheral edge portions thereof such that central portions thereof are free to move laterally with respect to said valve seat, a separate valve element disposed between said crystal and said valve seat, said element cooperatively supported in such position by mutual contact with said crystal and said valve seat, means for energizing said crystal so as to laterally bend said central portions so as to move said element respectively into contact with and away from said valve seat to open and close said valve assembly, the planar perimetric configuration of said crystal differing from the cross-sectional configuration of said bore, said bore being cylindrical and said crystal being of generally rectangular configuration, and a ledge inwardly extending from said bore and in contact with planar face surface portions of said crystal opposite from that surface proximal said valve seat, said ledge being circular and said crystal being square, the diagonal dimensions of said crystal being just slightly less than that of the diameter of said bore, and the diameter of said circular ledge being just slightly greater than the length of one of the sides of said crystal, whereby only the corner portions of said crystal are supported by said ledge.

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**4,298,182**

## LOCKING FLUID VALVE

**Duane C. Balch, 3827 Briarwood St., Napa, Calif. 94558**

**Filed Jul. 17, 1980, Ser. No. 169,889**

**Int. Cl.³ F16K *1/00, 35/02, 31/60***

**U.S. Cl. 251—251** **6 Claims**

1. A locking drain valve assembly comprising:

a. a valve housing **1** having an upper wall **2**, side walls **3** and bottom wall **4** including;

(1) a drain passage **6** formed through said housing having an inlet opening **7** in said top wall and an outlet opening **8** in said bottom wall,

(2) a transverse passage **12** formed through said side wall intersecting said drain passage,

(3) a valve seat **13** formed in said transverse passage at the intersection of said drain passage,

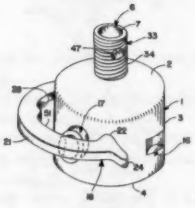
(4) hinge attachment means **14** formed in said housing and positioned offset from said transverse passage;

(5) catch means **16** formed in said housing at a selected distance from said hinge attachment means;

b. a valve piston member **17** formed for reciprocation within said transverse passage and dimensioned for sealing engagement with said valve seat in a closed position and away from said valve seat in an open position,

c. a piston closure member **18** including:

(1) pivot means **19** for pivotal attachment to said hinge attachment means **14**,



(2) a spring lever portion **21** extending outwardly from said housing having engaged and unengaged positions,

(3) latch means **22** formed in the distal end **27** of said piston closure member at a selected arcuate distance from said hinge attachment means **14** which in its unstressed state is less than the arcuate distance of said catch **16** from said hinge attachment means **14** so that when said piston closure member is in said engaged position said spring lever portion is in tension,

(4) grip means **24** extending from said distal end **27** for receiving a finger or tool for moving said piston closure member,

(5) piston engagement means **26** connected to said piston closure member for engaging said valve piston member and urging said valve piston member toward said closed position;

d. spring means **31** connected to said housing and urging said valve piston member to said open position, and

e. connection means **33** operatively connecting said drain passage in said housing and adapted for connection to a fluid source.

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**4,298,183**

## WATER TAP

**Youichi Kawakami, Hamamatsu, Japan, assignor to Mizue Kawakami, Hamamatsu, Japan**

**Filed Mar. 4, 1980, Ser. No. 127,128**

**Claims priority, application Japan, Mar. 13, 1979, 54-31926[U]**

**Int. Cl.³ F16K *31/524;* G05G *5/06***

**U.S. Cl. 251—263** **6 Claims**

1. A water tap comprising:

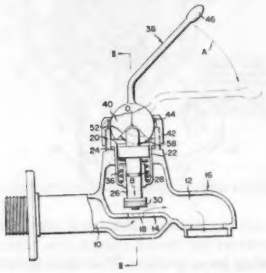
a main body having inflow and outflow passages, a partition wall for partitioning the interior of the main body into said inflow and outflow passages, and a communication hole in said partition wall providing fluid communication between said inflow and outflow passages;

a valve body having one end and the other end which is located further away from said communication hole than

said one end thereof; said valve body disposed in said main body and being movable between a first position in which said one end of said valve body is abutted against said partition wall to close said communication hole in a watertight fashion and a second position in which said one end of said valve body is located away from said communication hole to permit said communication hole to be opened;

urging means disposed between said main body and said valve body and urging said valve body into said second position;

an operating lever having one end mounted in said main body for universal pivotal movement, one end of said operating lever being provided with a pair of grooves extending along a plane including a center axis of said main body, one of which is arranged at one side of said one plane and the other of which is arranged at the other side of said one plane; a cam surface provided on said one end of said operating lever, arranged between said pair of grooves, extending in said plane and slidably contacting



with said other end of said valve body for moving said valve body into said first position when said operating lever is rotated in one direction in the plane and for moving said valve body into said second position when said operating lever is rotated in a direction opposite to said one direction;

rotating means provided between said one end of said operating lever and said other end of said valve body and permitting said one end of said operating lever to be rotated by an urging force of said urging means in a direction transverse to said one plane; and

a pair of projections provided on said other end of said valve body and extending in the said pair of grooves whereby rotation of said operating lever in a direction transverse to said one plane causes said projections to be frictionally held in said grooves and thereby hold said operating lever in a selected position.

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**4,298,184**

## VALVE SEAL FOR A PRESSURE MEDIUM CONTROLLING VALVE

**Wolfgang Grünert; Johann Huber, both of Munich, and Kurt Rheindt, Freilassing, all of Fed. Rep. of Germany, assignors to Knorr-Bremse GmbH, Munich, Fed. Rep. of Germany**

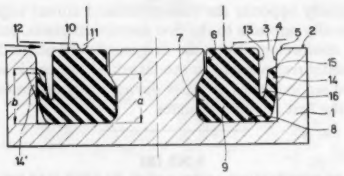
**Filed Mar. 6, 1980, Ser. No. 127,860**

**Claims priority, application Fed. Rep. of Germany, Mar. 6, 1979, 2908631**

**Int. Cl.**[3] **F16K** *25/00;* **F16J** *9/06, 15/22*

**U.S. Cl. 251—357** **3 Claims**

1. A valve seal for a pressure medium controlling valve comprising a valve member having a first surface directed toward a valve seat, there being an annular groove in said first surface and having a bottom surface, said annular groove further having a cylindrical first side directed toward the pressure medium and a second side with an undercut therein, a resilient sealing ring in said annular groove and having a first surface directed toward the valve seat, a first peripheral surface of said sealing ring being directed toward the pressure medium, an annular elastically deformable sealing lip having one end attached to a portion of said peripheral surface of the sealing ring away from said valve member first surface and adjacent said bottom surface of the groove and having a second end extending angularly outwardly toward said valve member first surface to abut resiliently against said groove



cylindrical first side to define a sealing edge, there being an annular space between the remaining portion of said peripheral surface of the sealing ring and said sealing lip, the length of said sealing lip being about ¾ of the axial dimension of said sealing ring disposed adjacent said cylindrical side of the groove and corresponding to the depth of said annular groove, said sealing ring having a second peripheral surface directed toward said annular groove second side and shaped to conform to said second side such that said sealing ring is secured within said groove.

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**4,298,185**

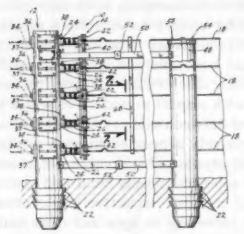
## FENCING DEVICE

**Paul H. Janssen, R.R. #1, Stanberry, Mo. 64489**

**Filed May 5, 1980, Ser. No. 146,281**

**Int. Cl.**[3] **E04H** *17/02*

**U.S. Cl. 256—41** **2 Claims**



1. A fencing system for securing a fence of the type having wires, including setting and maintaining the wires at a predetermined tension, comprising:

a first post having a bottom portion extending into the ground for rigidly fixing said post in one location;

a wire stretching device for stretching the wire, having turning rods and yokes, the rods passing through the yokes and wire wrapped there around as the rod is rotated to stretch the wire and a locking device, said locking device preventing the rod from rotating;

a tensioning unit connecting the stretching device to the first post including a first and second sleeve, the second sleeve being generally disposed within the first sleeve, and a spring, said spring at one end being adjustably connected to the first sleeve and connected to the second sleeve at its opposite end;

at least one field post, said field post having a bottom portion extending into the ground and being generally spaced away from the first post along the run of the wire having

one side thereof flattened along its longitudinal axis in juxtaposition with the wire, and guides, said guides extending outward from the flattened side of the field post underneath the wire and a rod, said rod extending downward through the guides and including a semicircular top portion extending onto the top of the post with the wire positioned between the post and the rod; and

a third post having a bottom portion extending into the ground, said third post being positioned at the opposite end of the wire as is the first post and onto which is securely connected the wire.

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**4,298,186**

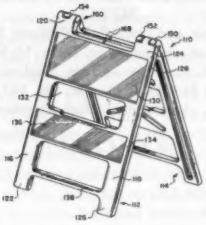
## HOLLOW PLASTIC BARRICADE

**Geoffrey M. Glass, 21 Bridlewood Rd., Northbrook, Ill. 60062**

**Filed May 21, 1980, Ser. No. 152,039**

**Int. Cl.³ E04H *17/14***

**U.S. Cl. 256—64** **21 Claims**



**1.** A hollow plastic barricade comprising a pair of identical, integral, hollow, hinged-together barricade frame members, each frame member having first and second hinge sections located at respective upper corners thereof with said first hinge section on one frame member cooperating with said second hinge section on the other frame member to form two hinges between said frame members, each frame member comprising two hollow, spaced apart side frame portions with a leg at the bottom of each side portion, an upper hollow panel, a middle hollow panel and a lower hollow sandbag bar, all extending between said side frame portions, said middle panel being spaced beneath said upper panel and said hollow sandbag bar being spaced beneath said middle panel and being spaced above the bottom of said legs a distance which will permit the barricade to be placed over uneven terrain and still be supported by said legs, at least one of said panels being adapted to receive indicia thereon, said first and second hinge sections each including at least one arcuately extending hook-like projection with a bore extending transversely through the sides thereof and with an end surface adapted to engage and bear against a top edge of the other frame member, each frame member having an opening for placing particulate ballast material, such as sand, in said frame member, and said barricade further comprising two pins each of which is received through a pair of adjacent projections extending from respective ones of said frame members.

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**4,298,187**

## APPARATUS FOR INLINE DEGASSING AND FILTRATION OF MOLTEN METAL

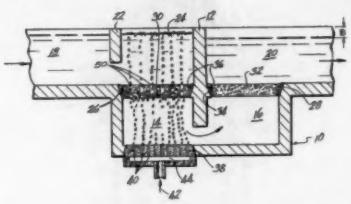
**Jonathan A. Dantzig, New Haven, and Derek E. Tyler, Cheshire, both of Conn., assignors to Swiss Aluminium Ltd., Chippis, Switzerland**

**Continuation of Ser. No. 900,122, Apr. 26, 1978, Pat. No. 4,159,104. This application Jan. 15, 1979, Ser. No. 3,173**

**The portion of the term of this patent subsequent to Jun. 26, 1996, has been disclaimed.**

**Int. Cl.³ C21C *7/00***

**U.S. Cl. 266—217** **3 Claims**



**1.** An apparatus for the degassing and filtration of molten metal comprising:

chamber means having inlet means, outlet means, and at least one filter plate means;

wall means associated with said chamber means, said wall means being adapted to support said at least one filter plate means; and

fluxing gas inlet means positioned in said chamber means with respect to said at least one filter plate means such that fluxing gas issuing from said fluxing gas inlet means passes through said at least one filter plate means wherein said fluxing gas inlet means comprises a sparger plate being provided with an array of orifices of controlled size and spacing wherein said orifice size is in the range of 0.005" to 0.050" and said orifice spacing is in the range of 0.25" to 5.00" so as to minimize fluxing gas bubble size while maximizing fluxing gas bubble dispersion thereby optimizing the degassing of said molten metal.

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**4,298,188**

## MACHINES FOR COOLING METAL SHEETS OR LIKE PRODUCTS

**Alfred Germain, and Georges Bonnaour du Tartre, both of Dunkerque, France, assignors to Union Siderurgique du nord et de l'est de la France ("USINOR"), France**

**Filed Jun. 4, 1980, Ser. No. 156,344**

**Claims priority, application France, Jun. 13, 1979, 79 15107**

**Int. Cl.³ B08B *3/04*; F25D *13/06***

**U.S. Cl. 266—114** **3 Claims**

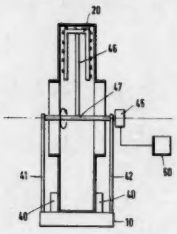
**1.** A machine for cooling sheets comprising a lower frame and an upper frame, sets of sheet driving and guiding rolls rotatively mounted in said frames, said frames defining an enclosure which surrounds said rolls and in which enclosure a cooling fluid circulates, a system of fluid discharge conduits connected to the upper frames and a system of fluid discharge conduits connected to the lower frame, the systems having discharge conduits disposed in the vicinity of input and output ends of the machine, a cooling fluid recovery tank, at least the discharge conduits connected to the upper frame and located in the vicinity of the input and output ends of the machine being connected to the cooling fluid recovery tank with interposition of a siphon, a priming device combined with said siphon for creating a depression in said siphon.

4,298,189

## APPARATUS FOR THE CONTINUOUS HARDENING OF PUMP CASINGS

Vinzenz Siller, Swartenhorst 3, 2000 Hamburg 71, Fed. Rep. of Germany

Division of Ser. No. 914,968, Jun. 12, 1978, Pat. No. 4,257,831.
This application Mar. 26, 1980, Ser. No. 134,118
Int. Cl.[3] C21D *1/08, 9/08;* B23K *7/10*
U.S. Cl. 266—123 14 Claims




1. An apparatus for the continuous hardening of pump casings which during use have a vertical axis and the casing having an arcuately shaped inner area generally encircling the vertical axis in an eccentric manner, the inner area may have an internal plating and depending on the hardening being effected the core characteristics of the material forming the inner area may be changed, wherein a fixed flame hardening apparatus with a flame hardening burner is arranged in the inner area of the pump casing, a supporting disc arranged horizontally in a machine frame, said disc rotatable by one drive mechanism and which can be swivelled about the horizontal by means of a further drive mechanism and retaining devices arranged on said supporting disc for receiving the pump casing.

14. An apparatus for the continuous hardening of pump casings which during use have a vertical axis and the casing having an arcuately shaped inner area generally encircling the vertical axis in an eccentric manner, the inner area may have an internal plating and depending on the hardening being effected the core characteristics of the material forming the inner area may be changed, wherein a machine frame with support means for maintaining the pump casing in the vertical position, two vertical arm-like bearing supports spaced from one another on either side of the pump casing, a drivable shaft means mounted in said bearing supports, said drivable shaft means having a swivel arm fixed to it at its free end carrying the flame hardening apparatus with a flame hardening burner.

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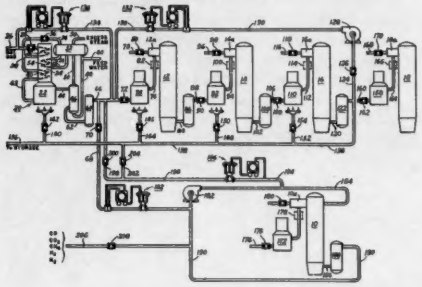
4,298,190

## APPARATUS FOR GASEOUS REDUCTION OF METAL ORES WITH COOLING LOOP

Patrick W. MacKay, Monterrey, Mexico, assignor to Fierro Esponja, S.A., Monterrey, Mexico

Continuation of Ser. No. 833,695, Sep. 15, 1977, abandoned, which is a division of Ser. No. 635,655, Nov. 26, 1975, Pat. No. 4,067,728, which is a continuation of Ser. No. 516,095, Oct. 18, 1974, abandoned. This application Feb. 5, 1979, Ser. No. 9,684
Int. Cl.[3] C21B *13/02*
U.S. Cl. 266—156 8 Claims

1. In apparatus for the batchwise gaseous reduction of iron ore to sponge iron in a multiple reactor system of the type which comprises a plurality of reactors including a cooling reactor and a series of reduction reactors in which separate bodies of iron-bearing material are simultaneously treated, a source of reducing gas composed largely of carbon monoxide and hydrogen, a cooling gas loop including said cooling reactor, a pump for circulating cooling gas through said loop and a cooler for cooling the circulating gas, a first conduit interconnecting said source to said loop and a second conduit connecting said loop to the inlet of the first reduction reactor of said series, the improvement which comprises a third conduit directly interconnecting said first and second conduits outside



said loop to by-pass said loop and minimize the pressure drop between said source and said first reduction reactor.

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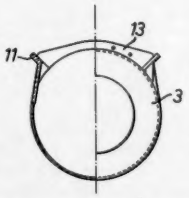
4,298,191

## MOBILE APPARATUS FOR CONTAINING MOLTEN METAL

Donald A. Atkinson, and Colin F. McCulloch, both of Stockton-on-Tees, England, assignors to Davy McKee (Minerals & Metals) Limited, Stockton-on-Tees, England

Filed Jan. 21, 1980, Ser. No. 113,699
Claims priority, application United Kingdom, Jan. 19, 1979, 02031/79
Int. Cl.[3] C21B *3/10*
U.S. Cl. 266—165 6 Claims




1. Mobile apparatus for transporting molten metal, comprising:

an elongate vessel rotatably supported at its ends on a pair of bogie assemblies;

opening means defined within a wall portion of said vessel for permitting personnel access to the interior of said vessel;

flange means fixedly secured upon said vessel within the vicinity of said opening; and

lid means removably secured to said flange means for partially covering said opening means and thereby defining a spout means for loading and discharging of said molten metal into and out of said vessel when said lid means is disposed upon said vessel, yet permitting access to said interior of said vessel by said personnel through said opening means when said lid means is removed from said vessel.

**4,298,192**

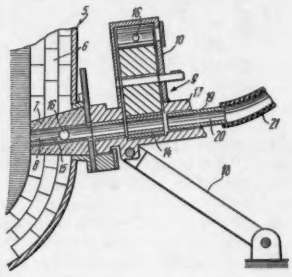
## METHOD OF INTRODUCING POWDERED REAGENTS INTO MOLTEN METALS AND APPARATUS FOR EFFECTING SAME

**Dzhondo F. Barbakadze, ulitsa Gldanskaya, 6, kv. 35, Tbilisi; Mamuka S. Mindeli, ulitsa Pionerskaya, 8, Rustavi; Petr G. Macharashvili, ulitsa Lenina, 27, kv. 8, Rustavi; Vazha V. Rusidze, prospekt Druzhby Narodov, 57, kv. 64, Rustavi, and Otari N. Suladze, Pionersky proezd, 3, Rustavi, all of U.S.S.R.**

**Division of Ser. No. 909,990, May 26, 1978. This application May 2, 1980, Ser. No. 146,374**

**Int. Cl.³ C21C *5/48***

**U.S. Cl. 266—218** **4 Claims**



1. An apparatus for carrying out the method of introducing powdered reagents into a molten metal, comprising: a metallurgical vessel containing a molten metal; a tuyere built into the refractory lining of said vessel; a tube provided with a plug and mounted inside said tuyere for axial movement of said tube and said plug therealong and through which tube a powdered reagent is fed into said vessel in a stream of carrier gas, said tube made up of separate sections placed end-to-end, each section being smaller in length than the thickness of said refractory lining of the vessel; a feed device provided with an actuator and mounted on the outside of said tuyere; a hollow cylinder of said feed device, mounted on said actuator, said actuator being operable to ensure butt-end connection of said hollow cylinder with said tuyere; a pusher mounted within said hollow cylinder at the side of the butt end thereof opposite to the butt end facing the tuyere; a feeder of said feed device, formed with at least two compartments of which one compartment accommodates said tube sections and the other one said plugs, said feeder being positioned approximately in the middle portion of the hollow cylinder; the interiors of said hollow cylinder and said feeder communicating with each other and thereby providing for alternate feeding of said tube sections and plugs from the interior of said feeder to the interior of said hollow cylinder and for their further transfer by means of said pusher into said tuyere.

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**4,298,193**

## UPPER MOUNTING UNIT FOR MACPHERSON STRUT ASSEMBLY

**Jack W. Mourray, West Bloomfield, Mich., assignor to Ford Motor Company, Dearborn, Mich.**

**Filed Oct. 10, 1979, Ser. No. 83,483**

**Int. Cl.³ B60G *11/38***

**U.S. Cl. 267—63 R** **17 Claims**

1. A mounting unit for the upper end of a MacPherson strut comprising;

a substantially horizontal mounting plate with a central aperture therethrough;

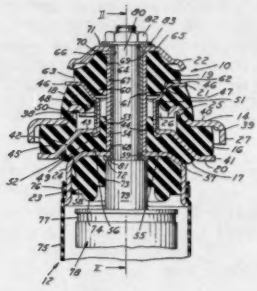
a first elastomeric isolator abutting a lower side of the mounting plate about said aperture and secured to said plate;

a second elastomeric isolator juxtaposed below said first isolator;

a third elastomeric isolator abutting an upper side of the mounting plate about said aperture and secured to said mounting plate;

said second elastomeric isolator having a different compression rate than said first isolator;

said mounting plate rigidly mountable to a motor vehicle



and said isolators aligned such that a passage is formed through said mounting unit to provide an outer end of a piston rod to extend therethrough and be mounted thereto such that upon jounce of a bumper, an upper end of a cylinder of a MacPherson strut becomes juxtaposed with said second isolator to compress one of said first and second isolators and then compress said other of said first and second isolators and upon rebound, a compressive force is applied to said third isolator.

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**4,298,194**

## GAS SPRING WITH IMPROVED TERMINAL CONNECTOR AND MOUNTING MEANS

**Thomas O. Marx, Rockton, Ill., assignor to Atwood Vacuum Machine Company, Rockton, Ill.**

**Filed Apr. 7, 1980, Ser. No. 137,746**

**Int. Cl.³ F16F *9/32***

**U.S. Cl. 267—64.11** **13 Claims**

1. An electrically conductive gas spring assembly comprising a fluid containing cylinder having closure means at one end thereof, a piston disposed for sliding reciprocating movement within said cylinder, an elongated plunger rod connected to

said piston and projecting out the other end of said cylinder for reciprocating movement with said piston, sealing means in said other cylinder end for supporting said plunger rod for sliding reciprocating movement, a terminal pin extending outwardly from said closure means at said one cylinder end, a terminal pin at an outer projecting end of said rod, conductive means electrically connecting said terminal pins through said cylinder and rod, mounting means at said one cylinder end and at said projecting rod end for use in mounting said gas spring between said cylinder end and projecting rod end, a terminal connector mounted on each said terminal pin and having a lead connecting portion, said terminal connectors each having integrally formed means tightly engaging the outer periphery of a respective terminal pin in electrical conducting relation for completing an electrical path between the lead connecting portions of said terminal connectors.

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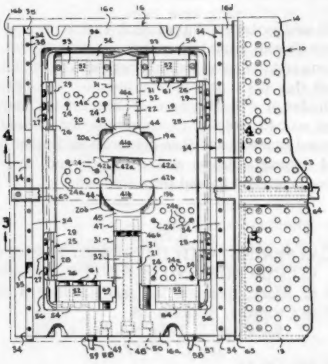
**4,298,195**

## QUICK SET HYDRAULICALLY ACTUATED CLAMPING TABLE

**Thomas F. McDougal, 1415 Beech La., Fairmont, W. Va. 26554**

**Filed Jun. 12, 1980, Ser. No. 158,823**
**Int. Cl.³ B23B** *31/16*
**U.S. Cl. 269—32** **22 Claims**



1. A quick set hydraulically actuated clamping table assembly, comprising a rigid base structure, at least one pair of companion flat platens supported closely adjacent each other in a common horizontal plane on said base for movement toward and away from each other having apertures for variably fixing jaw pieces thereon for holding workpieces thereon of various shapes, interfitting guide means on said platens and base confining relative movement of the platens to rectilinear approaching and withdrawing strokes along a reference axis, a pair of laterally adjacent elongated slide plates beneath said platens fixed respectively to an associated platen movable reciprocatively in sliding guided contact with the base parallel to said axis and having shaped cam follower recesses in adjacent confronting edges of the slide plates, a pair of semi-cylindrical bearing segment members located between said slide plates each having a flat diametric face and a convex face and having corner convex portions adjoining the diametric face located in a pair of the cam follower recesses of said slide plates, a pair of shaped bearings abutting the flat diametric faces of said segment members and working in said cam follower recesses, and resiliently biased concave face bearing blocks spaced in a direction paralleling said axis between said slide plate providing bearing faces against which the convex faces of said segment members work providing a centralizing mechanism correlating movement of the slide plates to equal and opposite movement, and hydraulic piston devices at the opposite ends of each of said slide plates interconnected to oppositely move said slide plates parallel to said axis in directions to carry the platens through said approaching and withdrawing strokes to clamp and release the workpiece.

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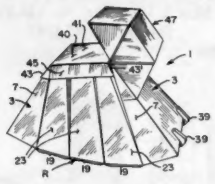
**4,298,196**

## ROCKING TOY

**Elizabeth J. Silver, 12172 Vivacite Walk, St. Louis, Mo. 63141**

**Filed May 10, 1979, Ser. No. 37,865**
**Int. Cl.³ A63G** *17/00*
**U.S. Cl. 272—52** **6 Claims**



1. A toy comprising a plurality of three-dimensional modules interconnected together, each of said modules being formed by folding flat, substantially rigid sheet-like material along prescored lines, said toy including a plurality of main body modules including a pair of end body modules and at least one intermediate body module between the end body modules, each of said body modules having a pair of generally tubular legs arranged in back-to-back relation with the innermost leg of said end body modules having an opening therethrough and with each of the legs of said intermediate body modules having a respective opening therethrough, a plurality of generally U-shaped top connecting modules each having a pair of legs, said legs of said top connecting modules being insertable into adjacent openings of adjacent body modules, a plurality of bottom connecting modules each having a pair of legs and a web interconnecting the legs, said legs of said bottom connecting modules being insertable into adjacent respective openings of adjacent body modules, and a plurality of side connecting modules each having a main panel insertable between the legs of one of the body modules, said side connecting modules each having side panels overlying the side of the leg of said one body module and of an adjacent leg of a next adjacent body module, and each side panel having a pair of end panels receivable between the legs of said next adjacent body module, said webs of said bottom connecting members forming a bottom surface, said modules when so assembled being securely interlocked with one another so as to form a substantially rigid toy capable of supporting a child sitting on the tops of said body modules to simulate riding.

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**4,298,197**

## BALANCE ASSIST FOR ROTATING RECREATIONAL DEVICES

**Rodger H. Flagg, 1415 Lynn Ave., Fort Wayne, Ind. 46805**

**Filed Jan. 29, 1979, Ser. No. 7,399**
**Int. Cl.³ A63B** *19/02*
**U.S. Cl. 272—115** **16 Claims**

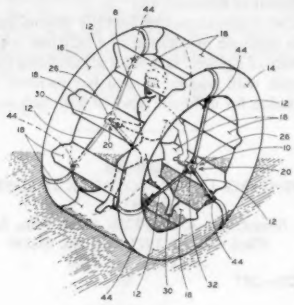
1. A removable apparatus to assist the balance of a user within a rotatable self-propelled recreational device having a pair of parallel coaxial rings supported in axially spaced relation to one another comprising:

a hub adapted to be positioned centrally at the axis of one of said rings;

gripping means being freely rotatably mounted to said hub; said gripping means being adapted for manual grasping by a user positioned between said rings to provide balance during propelling of the device, as the ring is being rotated about its axis;

a plurality of elongated members, each member being attached at one of its ends to said hub;

attaching means for removable attaching each of the other ends of each of said members to said rings in member



tensioned condition to position and tensionally support said hub centrally of said one ring.

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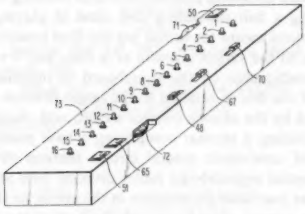
**4,298,198**

## ELECTRONIC GAME APPARATUS FOR A SINGLE PLAYER OR OPPOSING PLAYERS

**Thomas L. Huang, 7024 Burnside Dr., San Jose, Calif. 95120, and Ling Ling-Huang, 29 Scenic Dr., Poughkeepsie, N.Y. 12603**

**Filed Apr. 23, 1979, Ser. No. 32,383**
**Int. Cl.³ A63F 9/00**
**U.S. Cl. 273—1 GC** **32 Claims**



**1**. In a game apparatus, the combination comprising:

a plurality of selectively energizable light sources disposed for view by opposing players;

circuit means for controlling the energization of said light sources and having four states of operation, said circuit means being operative in first and second states to energize predetermined ones of said series of light sources to effect the appearance to the players of stationary lights, said circuit means being operative in third and fourth states to progressively energize said light sources in different directions between adjacent lights to effect the appearance to the players of a moving light;

means responsive to one of said predetermined light sources being energized to switch said circuit means into one of said first and second states;

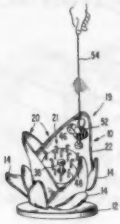
and first and second player-actuated switches each adapted to be controlled by different players to switch said circuit means between said third and fourth states so long as none of said predetermined light sources is energized, whereby each player may attempt to reverse the direction of the progression of energization of said light sources before such progression energizes a predetermined light source.

**4,298,199**

## GAME

**Steven C. Bush, Feasterville, and Robert E. Smathers, Glassboro, both of N.J., assignors to Product Dynamics, Ltd., Levittown, Pa.**

**Filed Jun. 20, 1979, Ser. No. 50,373**
**Int. Cl.³ A63F 9/00**
**U.S. Cl. 273—1 GD** **15 Claims**



**13**. A game comprising:

(a) a base;

(b) a plurality of trap elements pivotally mounted on the base, said elements being formed in the simulation of the petals of a flower and being arranged in a generally annular pattern about a substantially circular playing area, said elements being swingable between retracted positions in which they extend upwardly from the base and leave the playing area uncovered, whereby said flower appears as though in full bloom, said elements being swingable to advanced, closed positions in which they converge upwardly to cover said playing area and offer the appearance of a flower the bloom of which has closed;

(c) resilient yielding means tensioned to bias the trap elements to said advanced positions thereof;

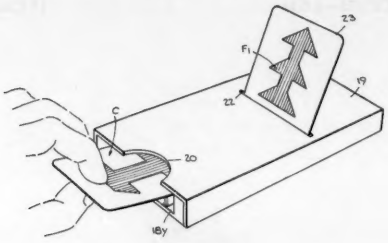
(d) an upstanding trigger member mounted for up-and-down movement centrally within the playing area and formed in the simulation of a pistil;

(e) a series of links connected between the trigger member and the several trap elements, said links being movable past dead center in one direction in respect to the resilient yielding means when the trigger member is shifted downwardly to releasably latch the trap elements in their retracted positions, said links when the trigger member is shifted upwardly being adapted to move past dead center in the opposite direction so as to release the force of the resilient yielding means for biasing of the trap elements thereby to their advanced positions;

(f) a game piece formed in the simulation of an insect and adapted to be suspended within the playing area by a player, said game piece and said trigger member including means adapted to shift the trigger member upwardly if the game piece moves into close proximity to the trigger member and is pulled upwardly by the player, whereby to cause the game piece to be trapped within the playing area by movement of the trap elements to their closed positions; and

(g) a plurality of game counters formed in the simulation of the stamens of said flower and removably supported in the playing area about the pistil, said game piece and counters having interengageable means whereby to permit removal of the counters individually, by withdrawal of the game piece from the playing area while keeping the same out of close proximity to the trigger member.

**4,298,200**
**TANGRAM GAME ASSEMBLY**
**Maurice S. Kanbar, 4 E. 77th St., New York, N.Y. 10021**
**Filed May 21, 1980, Ser. No. 151,836**
**Int. Cl.³ A63F 9/10**
**U.S. Cl. 273—157 R** **8 Claims**




1. A Tangram puzzle game assembly comprising:
A two sets of Tangram pieces each derived from a large square;
B a deck of cards each having printed thereon a Tangram puzzle figure and a solution thereto; and
C a box including a case divided into two compartments, the first housing said two sets of pieces and the second housing said cards, said box including means to support a selected card in an upright position at which it can be observed by players.

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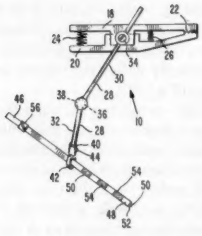
**4,298,201**
**GOLF ALIGNMENT DEVICE**
**Bernard Palinkas, 1017 Brunswick Pike, Lawrenceville, N.J. 08648**
**Filed Dec. 4, 1980, Ser. No. 213,139**
**Int. Cl.³ A63B 69/36**
**U.S. Cl. 273—183 B** **9 Claims**




1. A golf alignment device, for use by a golfer for correct placement of his golf club and body with respect to a golf ball upon execution of a golf swing, comprising:
(a) a retaining means being attachable with respect to the body of a golfer;
(b) a linkage means attached to said retaining means having at least a portion thereof being movable with respect to said retaining means;
(c) an attachment means connected to said retaining means and said linkage means for attachment therebetween;
(d) a securement means being secured to said linkage means;
(e) a bar member being secured to said securement means to be movably attached with respect to said linkage means, said bar member extending longitudinally and including at least a first side and a second side being of different colorations to facilitate viewing against backgrounds of different color shades, said bar member being rotatably movable about the longitudinally extending axis thereof with respect to said linkage means to selectively orient one of said first and second sides in the upwardly facing direction, said bar member further including a plurality of graduation markings extending therearound to facilitate judgement of distance; and
(f) a collar means extending laterally around said bar member to facilitate orientation of a golf ball with respect to the body of a golfer, said color means being longitudinally movable with respect to said bar member to vary the orientation for different types of golf club strokes.

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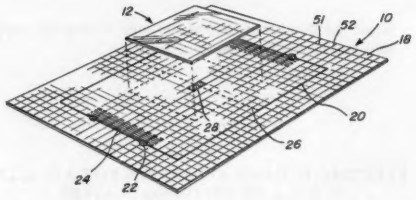
**4,298,202**
**BOARD GAME USING MOVABLE TRANSPARENT OVERLAY**
**Gilbert L. Singer, Rte. 4, Box 223a, Idaho Falls, Id. 83401**
**Filed Oct. 26, 1979, Ser. No. 88,390**
**Int. Cl.³ A63F 3/00**
**U.S. Cl. 273—247** **2 Claims**

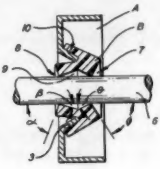



1. A board game device for simulating the play of a ball game comprising a gameboard having a generally planar top surface, a plurality of discs simulative of balls used in a game, said top surface including indicia designating a boundary line defining a rectangular area with the area enclosed by the boundary line including grid division lines defining target areas for locating a ball simulating disc used in playing a game, chance control means for indicating the final location of a disc in relation to the target position of a disc, and a transparent overlay positionable on the gameboard to indicate the final position of the disc in relation to the target position thereof as determined by the chance control means, said chance control means including a spinner comprising a base panel having a plurality of concentric spaced circles thereon divided into circumferential segments by radial division lines and a rotatable pointer journaled for rotation at the center of the concentric circles, certain of said segments defined by the concentric circles and radial division lines including ordinate numbers to indicate the coordinates of the relationship of the final position of the ball simulating disc to the target position thereof, said overlay including a grid thereon with ordinate numbers in certain areas corresponding to the ordinate numbers on the spinner to indicate the final position of the ball simulating disc, the ordinate numbers in the segments of the spinner increasing in numerical value from the inner circles toward the outer circles thereby increasing the distance between the target area and final position of a disc in accordance with the difficulty of the movement of the disc from an initial position toward a target area, said boundary line on the gameboard enclosing an area simulative of a soccer field and provided with goal posts at each end thereof and a goalie area inwardly of the boundary line adjacent the goal posts, a transverse centerline between the ends of the enclosed area, a kick-off square designated at the center of the enclosed area on both sides of the centerline to indicate a kick-off area for each team with the grid division lines enabling positioning of a disc thereon, certain of said discs being plain, some being provided with indicia to designate star players and a goalie with the discs being capable of movement in different manners on the top surface of the gameboard commensurate with their status.

## 4,298,203
## TWO PART SHAFT SEALING RING

Helmut Hölzer, and Ernst M. von Arndt, both of Weinheim, Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinhem, Fed. Rep. of Germany

Filed Nov. 18, 1980, Ser. No. 208,037
Claims priority, application Fed. Rep. of Germany, Dec. 12, 1979, 2949838
Int. Cl.³ F16J 15/32
U.S. Cl. 277—152 21 Claims

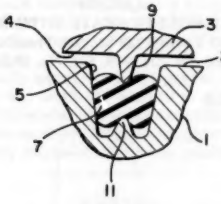


1. A two part shaft sealing r. g, which comprises:
an outer stiffening ring having a circular projection as the inside diameter surface, and
an elastically resilient, inner lip ring with front and back end faces and an inside diameter matching the outside diameter of the shaft to be sealed and having a concentric, circular slot in the back end face;
the profile of the circular slot matching the profile of the projection;
the mean diameter of the slot being smaller than the mean diameter of the projection;
the ratio of the depth of the slot to the length of the inside diameter wall of the lip ring being at most 0.6, and
the stiffening ring and lip ring being concentrically mated with the projection fitting into the slot.

## 4,298,204
## SEAL

Danny R. Jinkins, Bel Air, Md., assignor to Black & Decker Inc., Newark, Del.

Filed Jan. 21, 1980, Ser. No. 113,802
Int. Cl.³ F16J 15/16
U.S. Cl. 277—165 5 Claims

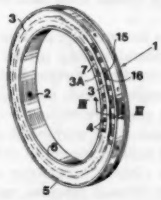


1. A seal for sealing a two-member joint comprising:
(a) a first planar surface on one of the members,
(b) a second planar surface on the other of the members disposed adjacent to and normally spaced from the first planar surface,
(c) a channel formed in one of the members in the planar surface thereof, the side walls of the channel being integral with the member and the surface, said side walls sloping outwardly such that the width of the base of the channel is narrower than the width of the opening of the channel,
(d) a projection formed in alignment with and projecting within the channel on the adjacent planar surface, and
(e) gasket means disposed in the channel and engaged by the projection to seal the joint at the first and second planar surfaces of the two respective members, wherein the width of the base of the channel is narrower than the width of the gasket means and the width of the opening of the channel is greater than the width of the gasket means.

## 4,298,205
## SEALING ELEMENT

Ingemar K. Ostling, Ronninge, Sweden, assignor to Sandvik Aktiebolag, Sandviken, Sweden

Continuation of Ser. No. 878,896, Feb. 17, 1978, abandoned.
This application Oct. 17, 1979, Ser. No. 85,761
Claims priority, application Sweden, Feb. 17, 1977, 7701745
Int. Cl.³ F16J 15/34
U.S. Cl. 277—197 14 Claims

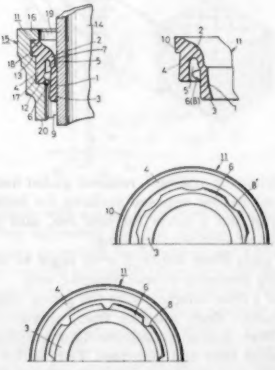


1. A sealing element comprising a holder including radially spaced annular surfaces defining an axially open slot therebetween, a sealing ring comprising a plurality of plates which are axially insertable into said slot and connected to said holder to form a unit therewith, said plates including annular inner and outer walls engaging said radially spaced surfaces of said holder, said plates being more than two in number, a rod mounted on each of said plates so as to project axially therefrom, said rods being formed of cemented carbide, each rod extending the full length of its associated plate so that with said plates arranged in end-to-end relationship in said slot, said rods are arranged in end-to-end relationship to form a continuous axially facing annular contact surface the diameter of which is greater than 300 mm, said plates being retained in said slot by means of a shrinkage fit with said holder.

## 4,298,206
## FLEXIBLE PACKING FOR SEALING PIPELINE JOINTS

Noriatsu Kojima, 31, Yanagishima-cho 5-chome, Nakagawa-ku Nagoya-shi, Japan

Filed Apr. 21, 1975, Ser. No. 569,699
Claims priority, application Japan, Apr. 21, 1974, 49-044674
Int. Cl.³ F16J 15/14
U.S. Cl. 277—205 28 Claims



1. A packing member of flexible elastic material, a pipe joint

member, said pipe joint member having means defining an inner peripheral configuration which includes portions generally transverse to the longitudinal axis thereof to seal a joint in a pipeline, and a pipeline having an axis and a non-grooved outer cylindrical surface, said packing member when assembled with said pipe joint member and said pipeline comprising:

inner peripheral means for sealingly engaging a portion of said pipeline by virtue of its elasticity and having a plain cylindrical inner surface;

outer peripheral means for sealingly engaging said pipe joint member, said means being relatively thick and having a configuration of shape and size complementary to that of said pipe joint member whereby to be securely held thereby against axial movement relative thereto, said outer peripheral means being spaced from said inner peripheral means; and

a generally annular intermediate portion connecting said inner and outer peripheral sealing means integrally with each other, said intermediate portion being relatively small in thickness as compared with said outer peripheral sealing means and being generally inclined relative to the axis of the pipeline from said outer peripheral sealing means to said inner peripheral sealing means to define an outwardly diverging annular clearance between said packing member and said portion of said pipeline, said pipe joint member defining an annular clearance which encircles said portion of said pipeline and which communicates with said outwardly divirging clearance, said intermediate portion being flexible and being tapered in thickness from the said outer means to the said inner means by being thinner at the said inner means than at the said outer means, whereby relative axial movement between said pipeline and pipe joint member will result in flexing and/or stretching of said intermediate portion prior to disturbance of the engagement to said outer peripheral means with said pipe joint member.

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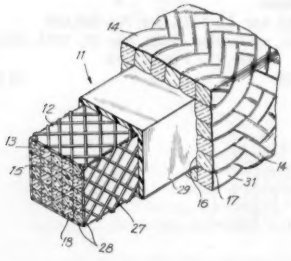
**4,298,207**

## RESILIENT GASKET MATERIAL

**Chester S. Hopper, Newtown, and Edward M. Case, Weston, both of Conn., assignors to The Marlo Company, Inc., Newtown, Conn.**

**Filed Aug. 29, 1980, Ser. No. 182,528**
**Int. Cl.³ F16J *15/22***
**U.S. Cl. 277—230** **21 Claims**




1. A chemically resistant, resilient gasket material, said gasket material having opposed surfaces for forming a seal between a rim and a cover for said rim, said gasket material having a cross-section comprising:

a core of glass fibers disposed at an angle to said surfaces for providing resilience to said material; and

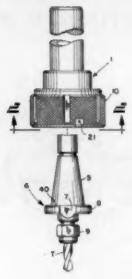
a jacket of a fiber selected from the group consisting of glass fiber, carbon fiber, graphite fiber, polytetrafluoroethylene (TFE) fiber, polymonochlorotrifluoroethylene (PMC) fiber and aramid fiber and dispersed TFE within said jacket in sufficient quantity to prevent the flow of liquid therethrough, said jacket being disposed about said core.

**4,298,208**

## SPRING ACTUATED CHUCK

**Milton L. Benjamin, and Wilbur N. Miles, both of Chagrin Falls, Ohio, assignors to Erickson Tool Company, Solon, Ohio**

**Filed Jan. 31, 1980, Ser. No. 117,348**
**Int. Cl.³ B23B *31/06, 31/44;* B23C *5/26***
**U.S. Cl. 279—91** **18 Claims**



1. In a chuck of the type wherein a holder has a tapered socket to receive the tapered shank of a flanged tool adapter and a pair of diametrically opposite keys to axially interfit in the slots in the flange of said adapter, the combination therewith of a nut having threaded engagement with said holder; a clamping ring angularly adjustably keyed and axially retained in said nut having a pair of radially inwardly extending clamping lugs to engage the axially outer face of said adapter flange to urge said shank into mating engagement with said socket upon rotation of said nut and ring in one direction from an unclamping position whereat said lugs are aligned with said keys; and an ejector rotatably and axially fixedly supported in said nut having a tubular portion surrounding said adapter flange and extending axially inward from said ring, said ejector having a radially inwardly extending ejector flange which is slotted to non-rotatably and axially slidably embrace said keys and which is engageable with the axially inner face of said adapter flange to disengage said shank from said socket during rotation of said nut and ring in the opposite direction to said unclamping position.

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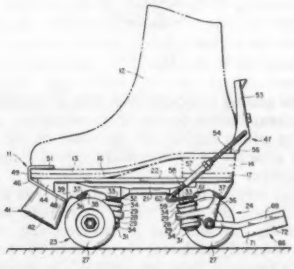
**4,298,209**

## DETACHABLE ROLLER SKATE WITH REAR BRAKE

**John Peters, 4637 Twentyfifth St., San Francisco, Calif. 94114**

**Filed Jul. 23, 1979, Ser. No. 59,526**
**Int. Cl.³ A63C *17/14***
**U.S. Cl. 280—11.2** **11 Claims**



1. In a roller skate: a horizontally extending base having an upper surface for receiving the bottom portion of a shoe, wheel trucks mounted on vertically extending posts toward the front and rear of the base, a toe stop projecting downwardly from the base in front of the front truck, a toe clip secured between

the toe stop and the base and extending upwardly about the base for engagement with the front portion of the shoe to limit forward and lateral movement of the shoe on the base, a mounting bracket having a flange affixed to the mounting post of the rear truck and a ferrule extending laterally of the base in front of the rear truck, and a releasable binding pivotally mounted in the mounting bracket ferrule and engageable with the rear portion of the shoe for cooperation with the toe clip to secure the skate to the shoe.

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**4,298,210**

## DEVICE ALLOWING A SAFETY CONNECTION BETWEEN THE PEDAL OF A BICYCLE AND THE SHOE WORN BY THE CYCLIST

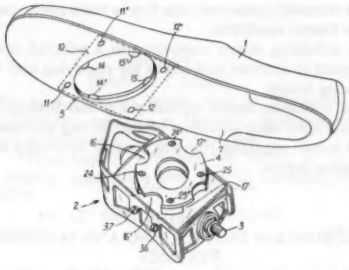
**Jacques Lotteau, 22, rue de Breteuil, 78670 - Villennes sur Seine; Jacques Bruker, 13, rue Boileau, 75016 - Paris, and Charles Freche, 9, rue Villebois-Mareuil, 75017 - Paris, all of France**

**Filed Feb. 21, 1980, Ser. No. 123,161**

**Claims priority, application France, Feb. 21, 1979, 79 04413**

**Int. Cl.³ B62M** *1/02*

**U.S. Cl. 280—259** **6 Claims**



**1**. A device for providing a positive pushing or pulling connection between a bicycle pedal and the shoe worn by the cyclist, said device comprising

a cylindrical block

a plate for supporting said cylindrical block with its cylindrical surface and one end surface exposed

means for removably connecting said support plate to the pedal

an open ended cylindrical housing adapted to axially receive said cylindrical block, said housing being disposed in the thickness of the sole of the cyclist's shoe,

radially inwardly extending lugs fast with the internal wall of said housing

circumferentially arranged recesses provided on the exposed surfaces of said block and adapted to axially receive said lugs, said recesses being L shaped in radial cross section to provide a bayonet type locking engagement when the lugs are angularly displaced after being axially received.

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**4,298,211**

## LOCK FOR A STAND OF A TWO-WHEELED VEHICLE

**Mamoru Shitamori, Kobe, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan**

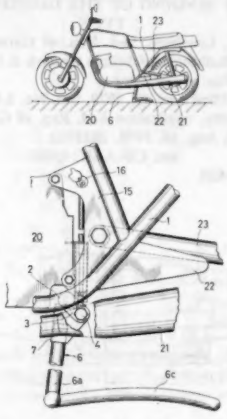
**Filed Aug. 3, 1979, Ser. No. 63,203**

**Claims priority, application Japan, Aug. 10, 1978, 53-109862[U]**

**Int. Cl.³ B62H** *5/00*

**U.S. Cl. 280—297** **2 Claims**

**1**. In a motorcycle vehicle including a frame, wheels mounted adjacent the ends of the frame and engine parts mounted on the frame and between the wheels, the improvement comprising a locking mechanism to prevent theft of the vehicle, at least one pivot shaft secured to a lower portion of the frame between the wheels, a sleeve pivotally mounted on said shaft, said pivot shaft and said sleeve being mounted and enclosed within said frame and engine parts, whereby said pivot shaft and said sleeve are protected by said frame and said engine parts against access and tampering, a stand secured to said sleeve, the stand being pivotable between an upright position and a retracted position and said sleeve moving during such pivotal movement around the pivot shaft, said sleeve thus being supported by said pivot shaft and said stand being supported by said sleeve, said locking mechanism comprising a recess formed in said sleeve, and pin means mounted on said



frame adjacent said recess and movable between an engaged position and a disengaged position, said recess and said pin means also being mounted and enclosed within said frame and engine parts, said pin means when in said engaged position extending into said recess when said stand is in said upright position and preventing said pivotal movement to said retracted position, and said pin means when in said disengaged position being displaced from said recess and permitting pivotal movement to said retracted position.

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**4,298,212**

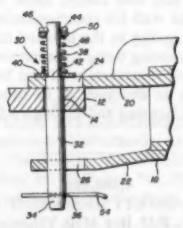
## HITCH PIN

**Merle A. Jamison, Rte. 2, Box 211, Salem, Va. 24153**

**Filed Nov. 27, 1979, Ser. No. 98,375**

**Int. Cl.³ B60D** *1/02*

**U.S. Cl. 280—515** **10 Claims**



**1**. In combination with a draft vehicle including a first rearwardly projecting supported tow bar portion defining a first upstanding opening extending therethrough and a towed apparatus including a second forwardly projecting tow bar portion horizontally lapped over and supported from said first tow bar portion and defining a second upstanding opening extending therethrough registered with said first opening, an upstanding hitch pin freely passed through said openings coupling said first and second tow bar portions together, said hitch pin including an upper end portion projecting above said second tow

bar portion, abutment means mounted on said upper end portion for vertical shifting relative thereto above a lower positive limit position on said upper end portion and opposing and abutted downwardly against said second tow bar portion, and pre-loaded force means connected between said abutment means and hitch pin yieldingly biasing said abutment means against upward movement from said lower limit position.

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**4,298,213**

## SKI SAFETY BINDING OF THE DIAGONAL RELEASE TYPE

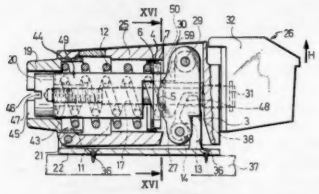
**Ralf Storandt, Leonberg, Fed. Rep. of Germany, assignor to Vereinigte Baubeschlagfabriken Gretsch & Co. GmbH, Leonberg, Fed. Rep. of Germany**

**Filed Jan. 10, 1979, Ser. No. 2,455**

**Claims priority, application Fed. Rep. of Germany, Jan. 23, 1978, 2802775; Aug. 16, 1978, 2835732**

**Int. Cl.³ A63C *9/085***

**U.S. Cl. 280—628** **39 Claims**



**1.** A safety binding for a ski comprising: a housing pivotally mounted about a transverse axis, a sole clamp carried by said housing, an upward release mechanism incorporating an adjustable upward release spring and operative to locate the housing and the sole clamp in a closed position and also to release said housing and said sole clamp for upward pivotal movement about said transverse axis once the release setting of said upward release spring is exceeded, a sideways release mechanism incorporating an adjustable sideways release spring one end of which bears against said housing, said sideways release mechanism being operative to locate the sole clamp sideways while allowing the sole clamp to be displaced sideways to either side of said housing once the release setting of the sideways release spring is exceeded, said upward and sideways release springs being coil springs of different diameters and located one within the other, said housing being provided with a transverse wall, said upward release spring being disposed on one side of said wall remote from said sole clamp, said upward release mechanism being located on the other side of said wall adjacent said sole clamp, there being at least one passage through said wall for communicating the force from the upward release spring to the upward release mechanism, the sideways release spring being a compression spring bearing at its one end on said transverse wall and being connected to said sole clamp via an abutment at its other end and a rod passing through the housing and through a further opening in said wall.

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**4,298,214**

## VEHICLE SAFETY RESTRAINT DEVICE

**Milton F. Brown, Jr., P.O. Box 4570, Virginia Beach, Va. 23454**

**Filed May 10, 1979, Ser. No. 37,649**

**Int. Cl.³ B60R *21/08***

**U.S. Cl. 280—735** **14 Claims**

**1.** A vehicle safety restraint for protecting occupants of a vehicle comprising

a. a confining means adapted in use for confining the upward and forward movements of an occupant of a vehicle;

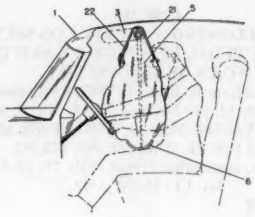
b. a container means mounted to the interior overhead of a vehicle for containing said confining means;

c. said confining means including at least one airbag and at least one extending torso and pelvic engaging safety restraint which are released from said container means upon application of extending and expanding forces;

d. a spring biased rotatable transverse tube supporting said container means in a ready position on the interior overhead of a vehicle;

e. a looped locking means for holding said rotatable transverse tube in a static ready condition;

f. a means for removing said looped locking means to release



said rotatable transverse tube from a static ready condition to a kinetic condition;

g. an activating means responsive to a selected condition adapted to activate said means for removing said looped locking means;

h. said container means including top and bottom covers which open upon actuation of said air bag and said torso and pelvic engaging restraint by said extending and expanding forces.

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**4,298,215**

## CARBONLESS DUPLICATING AND MARKING SYSTEMS

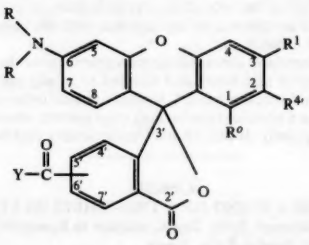
**Paul J. Schmidt, Sharonville, and William M. Hung, Cincinnati, both of Ohio, assignors to Sterling Drug Inc., New York, N.Y.**

**Continuation-in-part of Ser. No. 39,017, May 14, 1979, Pat. No. 4,274,660. This application Mar. 31, 1980, Ser. No. 135,855**

**Int. Cl.³ B41M *5/16, 5/18, 5/22***

**U.S. Cl. 282—27.5** **2 Claims**

**1.** A pressure-sensitive carbonless duplicating system or thermal marking system comprising a support sheet coated with a layer containing as a color-forming substance a 1-$R^o$-2-$R^{4'}$-3-$R^1$-6-$(R)_2$amino-5'/6'-Y-carbonylfluoran of the formula



wherein:

R represents a non-tertiary $C_1$ to $C_4$ alkyl;

$R^0$ and $R^1$ each represent hydrogen or a non-tertiary $C_1$ to $C_4$ alkyl;

$R^{4'}$ represents $—N(R^5)(R^{6'})$ in which

$R^5$ represents hydrogen, non-tertiary $C_1$ to $C_{18}$ alkyl, benzyl or benzyl substituted by halo, nitro, non-tertiary $C_1$ to $C_4$ alkyl or non-tertiary $C_1$ to $C_4$ alkoxy,

$R^{6'}$ represents hydrogen, non-tertiary $C_1$ to $C_{18}$ alkyl, benzyl or benzyl substituted by halo, nitro, non-tertiary $C_1$ to $C_4$ alkyl or non-tertiary $C_1$ to $C_4$ alkoxy or acyl, or

$R^5$ and $R^{6'}$ taken together with the nitrogen represent

2,5-$(R^7)_2$-1-pyrrolyl in which $R^7$ represents hydrogen or non-tertiary $C_1$ to $C_4$ alkyl;

Y represents $R^2O$ in which $R^2$ represents hydrogen, a non-tertiary $C_1$ to $C_{18}$ alkyl, benzyl or benzyl substituted by halo, nitro, a non-tertiary $C_1$ to $C_4$ alkyl or a non-tertiary $C_1$ to $C_4$ alkoxy, alkali metal cation or ammonium cation.

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**4,298,216**

**Patent Not Issued For This Number**

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**4,298,217**

## IDENTITY CARD

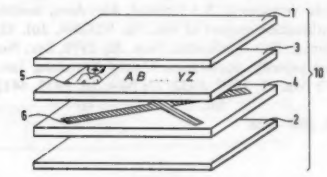
**Roland Moraw, and Helmut Walter, both of Wiesbaden, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany**

**Filed Aug. 29, 1979, Ser. No. 70,737**

**Claims priority, application Fed. Rep. of Germany, Sep. 6, 1978, 2838795**

**Int. Cl.³ G09F *3/02*; B42D *15/00***

**U.S. Cl. 283—7** **13 Claims**




1. An identity card, comprising:

a single monolithic body of a single synthetic resinous material containing at least one element of visible identifying indicia and, in the interior thereof, first and second elements of an optically recognizable security indicia, said first and second elements being spaced apart from each other in the direction of the thickness of said body and being in a fixed spatial relationship with respect to each other, whereby displacement of said first and second elements relative to each other provides an indication of tampering with the identity card, said body having been made by fusing together a first layer of heat plastifiable synthetic resinous material to a first surface of a second layer of the same heat plastifiable synthetic resinous material which contains said first element of security indicia on said first surface thereof, to provide a core comprised of said fused first and second layers, and fusing to at least one outer surface of said core a third layer of the same heat plastifiable synthetic resinous material, wherein said second element of security indicia is located at the interface between said third layer and the outer surface of said core.

**4,298,218**

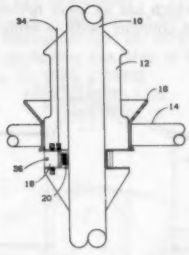
## LATCHING ASSEMBLY FOR RISER PIPE SPACERS

**James A. Britch, Westwego, La., assignor to Standard Oil Company (Indiana), Chicago, Ill.**

**Filed Aug. 30, 1979, Ser. No. 70,944**

**Int. Cl.³ F16L *35/00***

**U.S. Cl. 285—3** **5 Claims**




1. A latching means for use with a riser pipe connecting a subsea well and floating structure which comprises:

a donut housing placed about said riser pipe and attached thereto;

at least one hole in said donut housing opening to the exterior thereof and being perpendicular to the axis of the riser pipe about which the donut housing is placed;

a latch pin in said hole and having a latching recess;

a spring in said hole urging said latch pin outwardly away from said riser pipe toward a position wherein the outer end of said latch pin extends beyond said donut housing;

a release pin extending from said donut housing into said latching recess of said latch pin to hold said latch pin in position;

shear pin means limiting the outward movement of said latch pin when said releasing pin is released to hold said latch pin in a fixed position with respect to said donut housing.

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**4,298,219**

## QUICK-COUPLING BALL-AND-SOCKET JOINT

**Joost Amelink, Spaarndam, Netherlands, assignor to Scheepswerf Stapel B.V., Spaarndam, Netherlands**

**Filed May 15, 1979, Ser. No. 39,434**

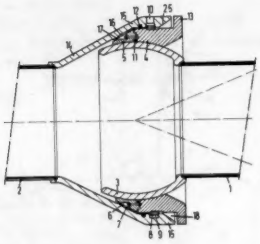
**Claims priority, application Netherlands, May 18, 1978, 7805407**

**Int. Cl.³ F16L *35/00***

**U.S. Cl. 285—24** **1 Claim**

1. A quick-coupling ball-and-socket joint for coupling two rigid pipe lengths comprising: a hollow ball secured to the end of a first pipe length, said ball having a flow passage therethrough communicating at one end with the interior of the first pipe length; an annular coupling body closing around and connecting with the ball, the annular coupling body having an interior surface complementary to and engaging the surface of the ball so as to be omnilaterally pivotable relative thereto, the end portion of said body facing away from the first pipe length

having a conical outer surface and the outer surface of said body axially adjacent the conical surface being cylindrical; the end portion of said body facing toward said first pipe length having a circumferential collar which projects radially outwardly; a sleeve coaxial with and secured to a second pipe length, the diameter of said collar being not less than the diameter of said sleeve and said sleeve having an interior conical surface and an axially adjacent cylindrical surface which are complementary to the conical surface and cylindrical surface on said coupling body, and said sleeve having an open end portion which terminates in an edge facing toward said first pipe length and which has an inner beveled surface so that when the ball and coupling body is being inserted into the



sleeve at an angle thereto said collar engages and coacts with said edge at a first location thereon and said beveled surface engages and coacts with said conical surface on said coupling body to aid in bringing the coupling body into centering relationship with the sleeve; and means for releasably locking the sleeve to the coupling body, said means including an annular circumferential groove in the outer cylindrical surface of the coupling body and an annular circumferential groove in the interior cylindrical surface of the sleeve, said grooves being so disposed that they come to lie opposite each other in the coupling position of the joint, and a circlip in one of the grooves projecting radially from said one groove in a manner such that the circlip is pressed into said one groove and then expands partially into the other groove while remaining partially in said one groove as said grooves come to lie opposite each other during insertion of the coupling body into the sleeve, the outer surface of the sleeve having a recess therein communicating with the respective groove to provide access for a releasing tool to engage the circlip.

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**4,298,220**
**PIPE JOINT**

**Tetsuo Kukuminato, Koshigaya, Japan, assignor to Shoketsu Kinzoku Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Apr. 20, 1979, Ser. No. 31,922**
**Claims priority, application Japan, Apr. 29, 1978, 53-58076**
**Int. Cl.³ F16L** *55/00*
**U.S. Cl. 285—178** **11 Claims**

1. A pipe joint comprising:

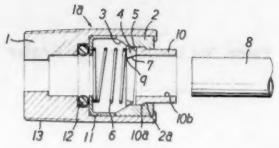
(a) a casing having a pipe receiving portion defining a passage for axially receiving a leading end of a pipe, the casing defining an entrance;

(b) a rigid clamp ring mounted within the casing transversally of the passage, the clamp ring having an inwardly tapered inner peripheral surface facing the entrance and terminating in a sharp inner edge defining an opening in the clamp ring;

(c) the clamp ring having an outer peripheral surface in sliding engagement with a contacting portion on the inner periphery of the pipe receiving portion for guiding the clamp ring between a first position, where the opening is eccentric to the axis of the passage and the tapered inner peripheral surface obstructs the passage, and a second position, where the opening is concentric to the axis of the passage and the tapered inner peripheral surface is removed from the passage,

(d) a spring in the casing urging the clamp ring into its first, eccentric position;

(e) the clamp ring being responsive to insertion of a pipe bend through the casing entrance along the passage and against the tapered inner peripheral surface, to be dis-



placed radially and axially from the first, eccentric position to the second, concentric position to facilitate movement of the pipe, the spring continuously urging the clamp ring such that its sharp innr edge engages the periphery of the inserted pipe; and

(f) a release ring mounted in the casing entrance concentrically of the passage and extending between the interior and exterior of the casing, the release ring being moveable against the clamp ring to displace it out of engagement with the pipe and facilitate removal of the pipe from the casing.

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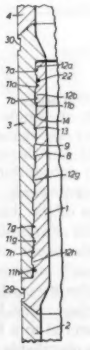
**4,298,221**
**PIPE CONNECTORS**

**John D. McGugan, Banchory, Scotland, assignor to Hunting Oilfield Services (U.K.) Limited, Aberdeen, Scotland**

**Continuation-in-part of Ser. No. 815,094, Jul. 13, 1977, abandoned. This application Nov. 30, 1978, Ser. No. 965,095**
**Claims priority, application United Kingdom, Jan. 26, 1977, 3227/77; Mar. 1, 1977, 8632/77; Nov. 10, 1978, 44120/78**
**Int. Cl.³ F16L** *25/00*
**U.S. Cl. 285—328** **12 Claims**



1. A pipe connector comprising:

a tubular pin member having a generally frusto-conical outer peripheral surface;

a tubular box member telescopically engageable with said pin member and having a generally frusto-conical inner peripheral surface corresponding to said frusto-conical surface of said pin member and which overlies said frusto-

conical surface of said pin member when said members are engaged; and

annular projection and groove means provided in said frusto-conical surfaces of said pin member and said box member, extending circumferentially thereof and interengageable to axially lock said pin member and said box member together;

said projection and groove means comprising projections and grooves having crest and root surfaces, being equally axially spaced apart along said frusto-conical surfaces, and having equal axial extents and being arranged so that, on assembly of said pin member and said box member, initial metal-to-metal force fit contact will be made between said crest surfaces of all said projections of said projection means of one of said frusto-conical surfaces and parts of the other of said frusto-conical surfaces between said groove means and adjacent the one of said grooves in which the respective projection is to be engaged;

wherein the radial dimensions of said projections and grooves in such that the expansion of said box member and/or contraction of said pin member resulting from forcing each said projection into the corresponding said groove during engagement of said members does not exceed the elastic limit of the material of said box member and/or said pin member; and

said pin member and said box member are arranged so that surfaces thereof engage one another in abutting force fit engagement when said pin member and said box member are fully interengaged.

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**4,298,222**

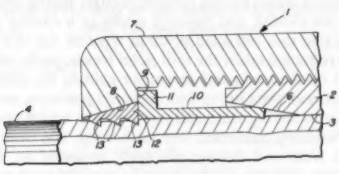
## TUBE COUPLING

**Irving W. Davies, North Olmsted, Ohio, assignor to Jaco Manufacturing Company, Berea, Ohio**

**Filed Jul. 23, 1980, Ser. No. 171,431**

**Int. Cl.³ F16L *19/08***

**U.S. Cl. 285—341** **3 Claims**



1. A tube coupling comprising nut and body members in screw threaded engagement with each other defining a tube receiving bore and an annular chamber surrounding a tube adapted to be inserted into such bore, said nut and body members having oppositely tapered cam surfaces constituting the end walls of said chamber which move toward each other upon screwing together of said nut and body members; a tube-embracing sleeve in said chamber having a radially contractible axially inner end portion engageable with the cam surface of said body member and having a radially enlarged collar at its axially outer end portion; and an externally tapered radially contractible C-shaped circular grip ring in said chamber engageable with the cam surface of said nut member and having internal circumferentially extending teeth; said collar and large end of said grip ring having interengaged plane annular end faces to transmit axial inward force from said grip ring to said sleeve to effect radial contraction of said axially inner end portion by the cam surface said body member into gripping and sealing engagement with the tube and to permit radial contraction of said grip ring to smaller diameter by the cam surface of said nut member whereat said teeth are embedded in the tube in gripping engagement therewith; said teeth having terminal sloping portions which fade out circumferentially and radially to the major diameter of said teeth in circumferentially spaced relation from the respective ends of said grip ring to preclude pinching of the tube when said grip ring is radially contracted to such smaller diameter.

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**4,298,223**

## DOOR LOCK, ESPECIALLY FOR MOTOR VEHICLE DOORS

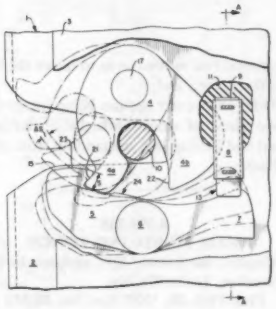
**Kurt Raffelsiefer, Velbert; Herman W. Kurth, and Fritz Häberle, both of Sindelfingen, all of Fed. Rep. of Germany, assignors to Arn. Kiekert Soehne and Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany**

**Continuation-in-part of Ser. No. 898,684, Apr. 21, 1978, abandoned. This application Apr. 16, 1979, Ser. No. 30,546**

**Claims priority, application Fed. Rep. of Germany, Apr. 21, 1977, 2717696; Jun. 22, 1977, 2728042**

**Int. Cl.³ E05C *3/26***

**U.S. Cl. 292—216** **12 Claims**



1. A door lock, comprising a fixed locking pin means, a rotary catch means rotatably mounted and adapted to engage the locking pin means upon a closing of the door, the rotary catch means being positionable in an open position, a preliminary locking position, and a main locking position, and means for determining a closure condition of the door, characterized in that the rotary catch means includes at least two radially aligned detent means disposed at different peripheral portions of the rotary catch means, a blocking means is rotatably supported at the lock and is adapted to engage in front of the detent means at defined engagement depths corresponding to the open, preliminary locking, and main locking positions, the engagement depth of the blocking means into the rotary catch means in the open and preliminary locking positions is smaller than the engagement depth in the main locking position, the closure condition determining means includes a microswitch means arranged in the door lock, the microswitch means includes a triggering means, and means are operatively connected to the blocking means so as to permit a pivotal movement in a direction of the microswitch means for actuating the triggering means such that the microswitch means responds only in a position of at least one of the blocking means and means operatively connected thereto at an engagement depth corresponding to the main locking position.

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**4,298,224**

## EAVES CLEANING IMPLEMENT

**Ralph D. Hansen, and Edna C. Hansen, both of Rte. 5, Box 382, Sioux Falls, S. Dak. 57101**

**Filed Feb. 25, 1980, Ser. No. 124,122**

**Int. Cl.³ A47F *13/06***

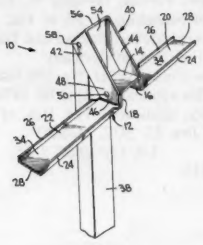
**U.S. Cl. 294—19 R** **6 Claims**

1. An implement for cleaning the overhead roof gutter of a building comprising:

(a) a tool positionable in the gutter and composed of oppositely extending coplanar channel-like blades having outer open ends and inner ends and having a raised center section joining the inner ends;

(b) a bracket fixed to the center section and extending angularly upwardly and outwardly therefrom;

(c) an elongated handle having an end attached to the bracket and depending therefrom when the tool is positioned in a gutter with the handle being held by a person



on the ground and moved so as to move the tool back and forth in the gutter, and;

(d) said blades and center section being integral and formed from one piece of stock with the center section being U-shaped and having legs upstanding from the inner ends of the blades.

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**4,298,225**

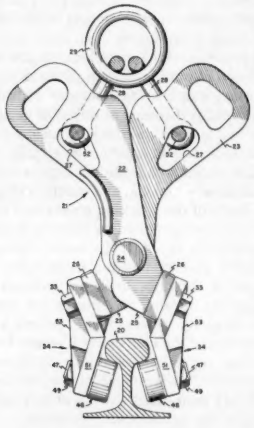
**RAIL HANDLING TONGS**

**William F. Cogdill, Bardstown, Ky., assignor to Safetran Systems Corporation, Louisville, Ky.**

**Filed Oct. 29, 1979, Ser. No. 88,841**

**Int. Cl.[3] B66C *1/28***

**U.S. Cl. 294—118** **10 Claims**



1. Rail handling apparatus for automatically seizing, gripping, raising, carrying, lowering and releasing a rail comprising

angularly pivotable, vertically elongated tong arms connected near their lower ends by a pivot pin and each having means forming a support aperture in its upper end,

a toggle link or shackle linking each support aperture with an overlying crane ring for support by a crane,

and slim tapered tong jaws protruding downward from the lower ends of the tong arms beneath the pivot pin, having converging outer jaw tip surfaces and inner jaw tip surfaces diverging at an acute angle surmounted by upwardly facing rail-supporting ledge surfaces positioned to embrace and support the ball of a rail flanked by the tong jaws in crane-suspended rail-carrying position,

with the converging outer jaw tip surface and the diverging inner jaw tip surface of each jaw forming between themselves a downwardly converging tapered jaw tip on each tong arm, co-acting with the ball of a rail during the juxtaposed descent of the tongs to divert and guide the tong jaws downwardly automatically past the rail ball without upsetting the tongs,

whereby automatic self-hooking of the tong ledge surfaces under the rail ball is achieved merely by downward movement toward the rail.

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**4,298,226**

**SUN-ROOF STRUCTURE FOR AUTOMOBILE BODIES**

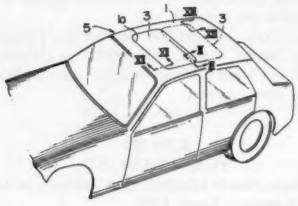
**Takashi Mizuma, Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Hiroshima, Japan**

**Filed Jan. 21, 1980, Ser. No. 113,523**

**Claims priority, application Japan, Jan. 22, 1979, 54-6333**

**Int. Cl.[3] B60J *7/04***

**U.S. Cl. 296—216** **5 Claims**



1. Sun-roof structure of a sliding-roof type for automobile bodies, said structure comprising roof panel means formed with opening means having peripheral edge, sliding roof means adapted for closing said opening means in a closing position and movable to a retracted position wherein the sliding roof means is retracted under the roof panel means, guide rail means provided on the roof panel means for guiding the sliding roof means between the closing and retracted positions, said guide rail means including front and rear sections which are downwardly bendably connected with each other, said front section having a front end portion pivotably mounted on the roof panel means, said rear section having a rear end portion pivotably mounted on the roof panel means, cam means provided on the roof panel means along the guide rail means and cam follower means provided on the sliding roof means for engagement in said closing and retracted positions of the sliding roof means with the cam means so that the sliding roof means is lifted when the cam follower means is engaged with the cam means, and means for interconnecting the sliding roof means with the guide rail means so that the guide rail means is lifted when the sliding roof means is lifted.

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**4,298,227**

**FOLDING CHAIR**

**Marc A. Berthier, 141 Bd. Saint-Michel, 75005 Paris, and Alain Y. Chauvel, 49 rue des Rigoles, 75020 Paris, both of France**

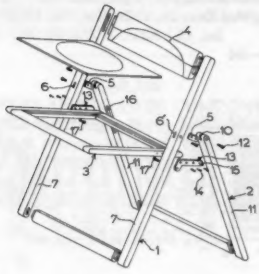
**Filed Aug. 16, 1978, Ser. No. 934,065**

**Int. Cl.[3] A47C *4/00***

**U.S. Cl. 297—58** **6 Claims**

1. Folding chair, comprising a front frame with a U-shaped lower part and a U-shaped rear frame, forming together the leg assembly of the chair, a back rest at the upper end of the front frame and a seat tray articulated to the front frame and cooperating with the rear frame, articulation means for the rear frame and for the seat tray being provided on the front frame so that in the folded position of the chair the rear frame and the seat are both situated in the same plane parallel to and outside that

of the front frame, said articulation means for the seat tray comprising connecting members each having at least two branches lying in the same plane, one branch being attached to the side of said seat tray and the other branch extending at an angle from said one branch and being pivotally connected to



said front frame below said seat tray when in the open position, said articulation means for said rear frame comprising connecting members attached to said front frame above said seat connecting members each extending rearwardly and being pivotally connected to said rear frame, and means for slidably engaging said seat tray with said rear frame.

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**4,298,228**

## COMBINATION FEEDING TRAY AND PLAY TABLE

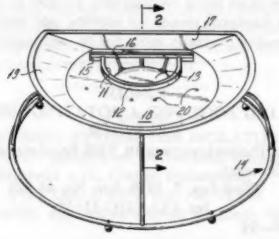
**Arthur T. Zampino, and Dolores V. Zampino, both of 120 Beach 19 St., Far Rockaway, N.Y. 11691**

**Filed Dec. 20, 1978, Ser. No. 971,396**

**The portion of the term of this patent subsequent to Jun. 13, 1995, has been disclaimed.**

**Int. Cl.³ A47D *15/00***

**U.S. Cl. 297—182** **7 Claims**



1. A combination feeding tray and play table adapted to be mounted on a chair-like device which comprises a substantially rigid unitary tray provided with a U-shaped opening or recess of sufficient size to accommodate the body of a child, said tray comprising a horizontal surface integral with an upwardly and outwardly inclined sliding surface of substantially equal depth in its entirety, surrounding the front and sides of said opening or recess, said horizontal surface being provided at its inner edge adjacent said U-shaped opening with an upstanding substantially perpendicular extension of sufficient height to prevent toys and food from falling into the seat of said chair-like device, said horizontal surface being additionally provided with counter-sunk openings for removably receiving toys and feeding plates mounted on equally sized and shaped ends adapted to frictionally fit into said openings.

**4,298,229**

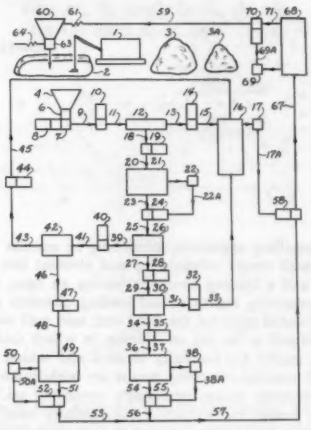
## PROCESS FOR DRY MINING PHOSPHATE ORE UTILIZING A SUPERSONIC GAS

**Sebastian J. D'Alli, 2405 Ixora Ave., Sarasota, Fla. 33580**

**Continuation-in-part of Ser. No. 29,057, Apr. 11, 1979, abandoned, and a continuation-in-part of Ser. No. 882,851, Mar. 2, 1978, abandoned, and a continuation-in-part of Ser. No. 669,711, Apr. 12, 1976, abandoned. This application Mar. 6, 1980, Ser. No. 129,615**

**Int. Cl.³ E21C *41/14***

**U.S. Cl. 299—7** **5 Claims**



1. A method of processing as mined dry or damp phosphate matrix comprising:

(a) depositing dry or damp phosphate matrix from a mine pit into a stream of carrier gas moving at supersonic velocity;

(b) comminuting said phosphate matrix by the high impact force of said gas moving at supersonic velocity to form a loosely held heterogeneous mass of phosphatic materials, sand and clay, said phosphatic materials comprising phosphate pebbles and finer phosphatic values;

(c) drying said mass of phosphatic materials, sand and clay, with said gas;

(d) transporting said mass of phosphatic materials, sand and clay in said gas at supersonic velocity to a first separation zone to separate said phosphate pebbles from a residual mixture of said finer phosphatic values, sand and clay;

(e) transporting said phosphate pebbles to storage bins at supersonic velocity;

(f) transporting said mixture of finer phosphatic values, sand and clay at supersonic velocity to a plurality of different separating zones arranged in a series-parallel configuration wherein the phosphatic values, sand and clay, are separated from each other by centrifugal force at supersonic velocity;

(g) transporting said phosphatic values at supersonic velocity to storage bins;

(h) recombining said sand and clay in approximately equal proportions by weight at supersonic velocity;

(i) collecting the Radon-222;

(j) combining said recombined mixture of sand and clay with said Radon-222 at supersonic velocity;

(k) transporting said recombined mixture of sand and clay and said Radon-222 at supersonic velocity to the mined out pits; and

(l) depositing said recombined mixture and said Radon-222 therein.

**4,298,230**

## TUNNELLING APPARATUS

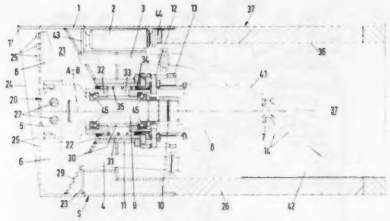
**Wilfried Krabbe, Dreieich-Buchschlag, Fed. Rep. of Germany, assignor to Philipp Holzmann Aktiengesellschaft, Fed. Rep. of Germany**

**Filed Jun. 12, 1980, Ser. No. 158,997**

**Claims priority, application Fed. Rep. of Germany, Jun. 25, 1979, 2925505**

**Int. Cl.³ E21D *9/10***

**U.S. Cl. 299—33** **8 Claims**



**1**. A tunnelling apparatus comprising an annular tunnelling element; wall means subdividing said element into a trailing chamber and a leading chamber having an open front end; material-removing means in said leading chamber to remove material located adjacent the front end; said wall means being further defined as having an opening in which said material-removing means are normally located and which is opened when said material-removing means are withdrawn from said leading chamber; means detachably mounting said material-removing means for retraction substantially axially of said element from said leading chamber at least into said trailing chamber; said apparatus further comprising a bearing sleeve surrounding said shaft and in which said shaft is rotatable but axially fixed; a housing sleeve surrounding said bearing sleeve and in which said bearing sleeve is axially movable as a cylinder and defines an annular fluid chamber adapted to receive pressure fluid from a source.

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**4,298,231**

## APPARATUS FOR USE IN UNDER-GROUND LONG WALL MINE WORKINGS

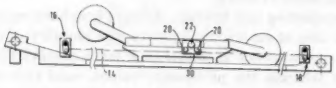
**Adam M. Spence, 19 Riverhead, Sprotborough, Doncaster, Yorkshire, and James R. Goff, The Barn House, Brockenhurst, Hampshire, both of England**

**Filed Jan. 14, 1980, Ser. No. 111,631**

**Claims priority, application United Kingdom, Dec. 29, 1978, 50349/78**

**Int. Cl.³ E21C *29/10***

**U.S. Cl. 299—50** **7 Claims**



**1**. In or for an underground mine working in which the material to be mined is removed from a face of the working by a cutting machine operative to remove material from the face in each of its opposite directions of traverse therealong, the combination of a haulage chain adapted to co-operate with a drive element on the cutting machine, and a fluid-powered take up means located at each end of the haulage chain by which the machine undergoes a working traverse to remove the material from the face, wherein said take up means serves to take up slack in the haulage chain during such traverse of the face and control means operatively connected to both of said take up means is provided for rendering the take up means operative to take up the slack, or inoperative to provide a substantially fixed anchorage in coordination with the direction of traverse of the machine.

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**4,298,232**

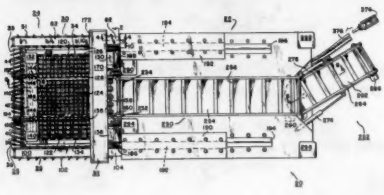
## MINING MACHINE

**Charles F. Mendola, South Bend, Ind., assignor to John J. Simala, South Bend, Ind., a part interest**

**Filed Dec. 26, 1979, Ser. No. 106,679**

**Int. Cl.³ E21C *27/12, 29/24***

**U.S. Cl. 299—64** **32 Claims**



**1**. A mining machine comprising an undercutting means for cutting into a coal vein at the floor level as said mining machine advances, a relief cutting means for cutting laterally from said undercutting means and for cutting progressively higher kerfs along the sides of the coal vein upwardly from said undercut, means for moving said relief cutting means from a lower position to a higher position to cut said kerfs, a chisel means for dislodging the coal above said undercut and between said kerfs in progressively higher extractions, a collecting means disposed rearwardly from said undercutting means for collecting said coal as it is removed by said undercutting and relief cutting means and dislodged by said chisel means, a loading means for receiving the coal from said collecting means and for moving the coal from said collecting means for removal from the mine, an elevating means for raising said relief cutting means and said chisel means in a substantially vertical manner so that progressively higher kerfs can be made by said relief cutting means and progressively higher extractions from the coal vein can be made by said chisel means after an initial cut by said undercutting means, said progressively higher extractions being substantially parallel to lower extractions, and a transport means for moving said machine, having a track assembly pivotally mounted to said machine.

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**4,298,233**

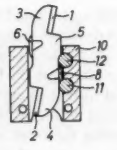
## MILLING TOOL FOR A ROTATING MILLING CYLINDER

**Gerd Elfgen, Theisenkreuzweg 10, 5303 Bornheim-Rösberg, Fed. Rep. of Germany**

**Filed Jun. 7, 1979, Ser. No. 46,328**

**Int. Cl.³ E21C *35/18***

**U.S. Cl. 299—91** **9 Claims**



**1**. A milling tool for insertion into a tool holder having an opening for receiving said tool, comprising an elongated body having a rectangular cross-section, a milling cutting head disposed at each end thereof, said heads being dimensioned so as not to protrude beyond said rectangular cross-section, a

protuberance provided on opposite sides of the body adjacent and below the cutting heads, said tool holder having a partial opening extending through the wall therein, stop means disposed in said partial opening and being configured to fill the partial opening with a part thereof extending into said tool holder opening, said stop means engaging one of said abutments when the body is positioned in said tool holder opening whereby the opposite abutment engages another part of the wall of said tool holder opening thereby effecting the holding of the body in the opening.

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**4,298,234**

## DRAWERS AND DRAWER COMPONENTS

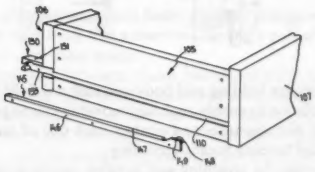
**Leon G. Litchfield, and Terence Hardy, both of Belper, England, assignors to L.B. (Plastics) Limited, Belper, England**

**Division of Ser. No. 816,039, Jul. 15, 1977, Pat. No. 4,162,114. This application Apr. 6, 1979, Ser. No. 27,765**

**Claims priority, application United Kingdom, Apr. 26, 1977, 17290/77**

**Int. Cl.³ F16C** *29/00, 29/10*

**U.S. Cl. 308—3.6** **6 Claims**



**1.** In an article of furniture comprising a cabinet or housing, a drawer assembly comprising a pair of drawer runners of L-shaped cross-section mounted in said cabinet or housing, and a drawer slidably supported on said drawer runners, the drawer having side walls provided with longitudinal tracks formed integrally therewith and having relatively narrow entrances thereto defined by upper and lower longitudinally extending lips projecting across the entrances to said tracks and being flush with the outer surfaces of said side walls, and the runners having horizontal drawer-engaging flanges extending into said tracks through said entrances and carrying front drawer guide and bearing members at their forward ends for supporting the drawer in sliding relationship thereon, the guide and bearing members being confined within said tracks by virtue of the narrow entrances thereto.

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**4,298,235**

## BEARING SYSTEM FOR ISOLATORS

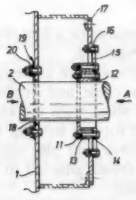
**Anton F. Squirrell, Samstagern, Switzerland, assignor to Grovag Grossventiltechnik A.G., Glarus, Switzerland**

**Filed Oct. 3, 1979, Ser. No. 81,343**

**Claims priority, application United Kingdom, Oct. 9, 1978, 39826/78**

**Int. Cl.³ F16C** *27/02*

**U.S. Cl. 308—26** **10 Claims**



**1.** A bearing system fitted around a shaft of an isolator, comprising a shaft seal fitted around the shaft, the shaft seal comprising at least one flexible annular metal disc attached to the isolator frame, and a bearing fitted around the shaft at a location spaced from the shaft seal, the bearing comprising at least three individually removable bearing segments secured to a bearing mounting by means of at least one flexible annular diaphragm.

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**4,298,236**

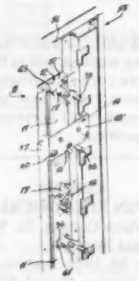
## SAFETY LOCK SYSTEM FOR VERTICALLY STACKED STORAGE ELEMENTS

**Robert N. Laroche, St. Julie, Canada, assignor to Artopex Inc., Laval, Canada**

**Filed Jul. 14, 1980, Ser. No. 168,738**

**Int. Cl.³ E05B** *65/46;* **E05C** *15/04*

**U.S. Cl. 312—215** **14 Claims**



**1.** A safety lock system for vertically stacked slideably retained storage elements, said system comprising one or more locking bars vertically slideably retained in alignment in vertical support guide means, two or more cam elements pivotally secured on a respective fixed pivot axis to said support guide means adjacent an opposed end of each said locking bars, each said cam elements having a cam portion retained in planar alignment with said locking bars and an activating arm portion for rotating said cam portion about said fixed pivot axis, a displaceable space below each cam element portion defined between one of said locking bar opposed ends and said cam portion, an engaging member secured to one or more of said storage elements to engage and displace said activating arm portion of an associated cam element by predetermined displacement of a storage element having said engaging member to cause rotation of said associated cam portion to slidingly displace said locking bars thereabove through said displaceable space in immovable contact with their associated cam elements and arrest sliding displacement of said locking bars therebelow to maintain them in immovable contact with their associated cam elements to thereby immobilize all other cam elements against rotational displacement and thereby prevent slideable displacement of all other of said storage elements having an engaging member.

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**4,298,237**

## PRINTED WIRING BOARD INTERCONNECTION APPARATUS

**Gary L. Griffith, Arvada, and Charles J. Sherman, Westminster, both of Colo., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

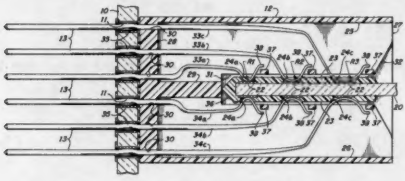
**Filed Dec. 20, 1979, Ser. No. 105,501**

**Int. Cl.³ H01R** *13/64*

**U.S. Cl. 339—17 L** **17 Claims**

**1.** Electrical interconnection apparatus comprising an electrical component **(20)** having at least a row of contact areas **(22)** affixed to a flat surface thereof along a first axis and a row of contact springs (e.g., **33**), each of said springs corresponding to one of said contact areas **(22)**, said springs having curved contact surfaces adapted for engaging said contact areas **(22)**,

characterized in an insulative mask (e.g., **23**) overlying said row of contact areas (**22**), said mask having a row of apertures (e.g., **24**) corresponding to said contact areas (**22**) for permitting electrical contact with each of said contact areas (**22**) by said curved contact surface of the corresponding one of said springs (e.g., **33**) and guide means (**31**) for guiding said component (**20**) and said mask along said axis into sliding engagement with said contact spring surfaces and in that said apertures and said contact surfaces are correspondingly, individually dimensioned so that said contact areas and said springs are maintained apart by said mask until corresponding contact areas and springs are in opposition.



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**4,298,238**

## MULTI-PIN ELECTRICAL PLUGS

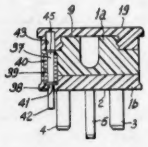
**Derek Hayes, Home Farm Cottage, St. Michael, Bungay, Suffolk NR35 1NF, Great Britain**

**Filed Dec. 19, 1979, Ser. No. 105,027**

**Claims priority, application United Kingdom, Jan. 5, 1979, 000405/79**

**Int. Cl.**[3] **H01R** *13/508*

**U.S. Cl. 339—63 M** **12 Claims**



**1**. A multi-pin electrical plug comprising a base having one surface from which the pins project, a cover removably mounted on a second surface of the base opposite to said one surface, interengaging means on the cover and the base by means of which the cover can be slid in a direction substantially perpendicular to the axes of said pins into a position of securement on the base, movable locking means for automatically locking said cover to the base, and resilient means which urges the locking means into a position in which, provided the cover is in said position of securement on the base, it locks the cover to the base whether or not the plug is inserted into a corresponding electrical socket.

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**4,298,239**

## TEST ACCESS APPARATUS

**Anthony R. Montalto, Edison; Louis J. Scerbo, Succasunna, and Jeremia P. Starace, Randolph Township, Morris County, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Sep. 26, 1979, Ser. No. 78,960**

**Int. Cl.**[3] **H01R** *13/629*

**U.S. Cl. 339—66 M** **2 Claims**

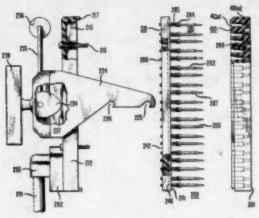
**1**. In combination with a main frame, electrical test apparatus for accessing a test field associated with said frame and providing electrical connection between a test station and a plurality of test points adapted to be accessible through apertures in said field, said field including a plurality of protuberances, each of said protuberances interposed between pairs of said test points, said test apparatus

characterized by

a body having a plurality of channels arranged in mirror-image relation to said apertures and a plurality of recesses arranged in mirror-image relation to said protuberances for registering said protuberances,

a plurality of electrically conductive spring-loaded pins having a movable end projecting beyond said body and a spring end fixed in said body,

means for electrically joining each said fixed spring end to said test station, and



means for holding said body and said test field in juxtaposed relation to enable each said movable end to penetrate each of said apertures and contact each one of said test points, said holding means including

means for attaching said holding means to said frame;

an eccentric cam mounted on said attaching means;

a drive plate affixed to said body and aligned with said cam; and

means for rotating said cam in increasing direction of eccentricity to slidably contact said drive plate and cause displacement of said body relative to said attaching means.

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**4,298,240**

## CABLE CONNECTOR

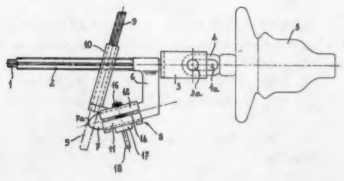
**Jacques Grillet, 54, Route de Saint-Nizier, Seyssins (Isere), France**

**Filed Feb. 1, 1980, Ser. No. 117,768**

**Claims priority, application France, Feb. 2, 1979, 79 03398**

**Int. Cl.**[3] **H01R** *11/15*

**U.S. Cl. 339—109** **26 Claims**



**1**. A device for connecting a first electrical cable to a second electrical cable, comprising:

a first member formed with a sleeve adapted to receive and engage said first cable, and a cylindrical pin connected to said sleeve but offset from the axis thereof;

a second member formed with an expandable opening and adapted to receive said pin, said second member being formed with a sheath adapted to receive and engage said second cable; and

clamping means adapted to close said opening around said pin and anchoring said sheath to the first member, said first member and said second member being composed of electrically conductive material whereby the clamping of

said second member around said pin electrically interconnects and mechanically connects said cables.

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**4,298,241**

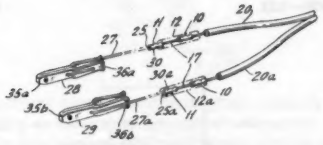
**SPLICER FUSE INTEGRATED IN LINE CORD PLUG**

**Elliot Bernstein, Rockville Centre, N.Y., assignor to Bel Fuse, Inc., Jersey City, N.J.**

**Filed Jan. 28, 1980, Ser. No. 115,670**

**Int. Cl.³ H01R *13/66***

**U.S. Cl. 339—147 P** **6 Claims**




1. A fused plug having a main body; a pair of prongs extending from said main body and a line cord having a pair of wires extending into said main body;

a fused connection between at least one of said wires and one of said prongs; said fused connection comprising a fuse wire, a sleeve secured at one end of the sleeve to one end of said fuse wire, the other end of said sleeve being secured to said line cord wire, the opposite end of said fuse wire being connected electrically to one of said prongs; said sleeve being crimped to the first end of the fuse wire at one end of said sleeve, the opposite end of said sleeve being crimped to said line cord wire; and an additional wire connected to said prong and a second sleeve secured to said opposite end of the fuse wire remote from the line cord wire; the end of the second sleeve opposite the end which is connected to the fuse wire being connected to said additional wire; said two sleeves being spaced from each other with the fuse wire extending between.

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**4,298,242**

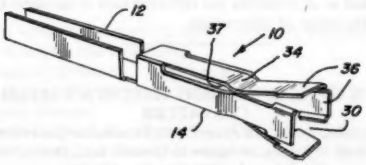
**ELECTRICAL SOCKET CONTACT**

**William H. McKee, West Covina, Calif., assignor to TRW Inc., Elk Grove Village, Ill.**

**Filed Feb. 23, 1979, Ser. No. 14,694**

**Int. Cl.³ H01R *13/11***

**U.S. Cl. 339—258 R** **22 Claims**




1. An electrical contact comprising a first box-like end and at least three discrete resilient walls extending from said first end; said walls being inwardly bent to form a restrictive throat portion and having portions outwardly flared from said throat portions to define a contact entrance oppositely disposed to said box-like end; each of said wall flared portions being inwardly resiliently movable for urging the wall throat-forming portions together; each of said walls being of a width greater than the width of the throat portion formed thereby and arranged relative to each other at said throat portion so as to extend beyond the edge of one adjacent wall only when said throat forming portions are urged together.

**4,298,243**

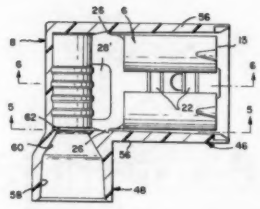
**PRE-INSULATED FLAG-TYPE TERMINAL**

**Robert C. Swengel, Jr., York County; Jon A. Fortuna, and George R. Deffibaugh, both of Cumberland County, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.**

**Filed Jun. 12, 1978, Ser. No. 914,310**

**Int. Cl.³ H01R *11/08***

**U.S. Cl. 339—276 F** **3 Claims**




1. A pre-insulated flag-type terminal device which is intended to be crimped onto the stripped end of an insulated wire, said terminal device comprising a metallic contact terminal and an insulating housing means,

said terminal comprising a contact portion, a crimp portion, and a flat transition section, said transition section being between said contact portion and said crimp portion and having side edges which extend from said contact portion to said crimp portion, an opening between said side edges, said opening having one edge which is proximate to said crimp portion and which extends transversely of said side edges,

said crimp portion comprising an arm extending from said transition section in the direction opposite to the direction of said contact portion, said arm being reversely formed towards said contact portion and towards said transition section, said arm having an end which extends transversely across said transition section, said end having an ear extending centrally therefrom into said opening, said ear having a leading edge which extends beside said one edge of said opening, an adjacent portion of said end of said arm which is on one side of said ear being adjacent to said transition section whereby said arm forms a tubular ferrule having a wire-receiving end which is at one of said side edges,

said housing means being generally flag-shaped and having a terminal housing portion and wire-receiving housing arm extending therefrom, a terminal receiving cavity in said housing portion and a wire-receiving opening extending through said housing arm and communicating with said cavity,

said terminal being in said cavity with said ferrule in alignment with said opening,

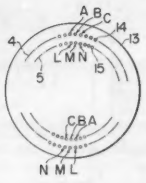
said wire-receiving opening having a conical inner end portion adjacent to said cavity, a constricted wire-admitting port at the inner end of said conical inner end portion, said port being immediately adjacent to, and concentric with, said wire-receiving end of said ferrule whereby,

upon insertion of the stripped end portion of an insulated wire into said opening, the leading end of said wire will be guided by said conical surface through said port and will immediately enter said ferrule, and upon subsequent crimping, said ferrule will be crimped onto said stripped end of said wire.

## 4,298,244
## INFORMATION RECORDING METHOD AND APPARATUS

Yutaka Kaneko, Kawasaki, and Mitsuhisa Fukuda, Tokyo, both of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Feb. 28, 1979, Ser. No. 16,101
Claims priority, application Japan, Feb. 28, 1978, 53-22468; May 19, 1978, 53-59810; Jun. 20, 1978, 53-74723
Int. Cl.[3] G03H *1/22*
U.S. Cl. 350—3.78 1 Claim




1. In an information recording method capable of recording multiple pieces of hologram information in areas disposed along concentric tracks arranged on the surface of a hologram recording medium disc, and of reading and reproducing the recorded hologram information, the improvement comprising the steps of:

setting a plurality of n different diameter concentric tracks on the surface of said recording medium disc;

recording an identical series of hologram patterns of information around substantially the entire circumference of each of said tracks, with the recording position of said patterns of information in each track shifted by $2\pi/n$ rad with respect to like patterns in the other tracks;

illuminating the medium disc at a circumferential location thereof with an illuminating light to reproduce hologram information at that circumferential location;

rotating the medium disc in one of the clockwise and counterclockwise directions no more than $\pi/n$ rad, to bring any selected one of the series of information to the fixed circumferential location;

holding the disc stationary while illuminating the disc; and

deflecting the illuminating light radially of the disc to illuminate the selected information in its respective track.

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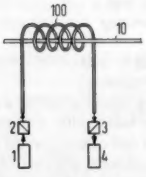
## 4,298,245
## WAVEGUIDES WITH A LOW BIREFRINGENCE

Hubert Aulich, and Alfred Papp, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 6, 1979, Ser. No. 64,045
Claims priority, application Fed. Rep. of Germany, Sep. 21, 1978, 2841162
Int. Cl.[3] G02B *5/172;* G02F *1/09*
U.S. Cl. 350—96.29 10 Claims




1. In a magneto-optical transducer having a light waveguide for conducting light which waveguide is wound into a coil, and having means for projecting polarized light into at least one end of the waveguide and means for measuring the amount of rotation in the polarized light leaving at least one end of the waveguide, the improvement comprising said light waveguide being a cladded optical fiber having a core of quartz glass and a cladding of synthetic material so that the light waveguide even with mechanical stresses from being wound in a coil has no noticeable birefringence.

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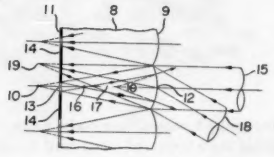
## 4,298,246
## REFLECTION TYPE SCREEN

Seishiro Iwamura, Nagaokakyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 7, 1979, Ser. No. 92,032
Claims priority, application Japan, Nov. 8, 1978, 53-137696
Int. Cl.[3] G03B *21/56*
U.S. Cl. 350—122 6 Claims




1. A reflection type projection screen, comprising,

a transparent substrate having a thickness of 0.1 to 2.0 mm;

a plurality of convex lenses formed on the front surface of said transparent substrate and being of a size so as to be nondiscriminatable from an observers position;

said convex lenses having a focal length which gives a focus behind the rear surface of said transparent substrate and wherein the ratio of vertical height to transversal width of said lenses is greater than one and the vertical height is 0.1 to 2.0 mm;

said rear surface of said transparent substrate having a plurality of mirror areas and a plurality of light absorbing areas where the mirror areas constitute from 28% to 37% of the total area and the light absorbing areas constitute from 72% to 63% of the total area;

wherein light rays arriving from a projector substantially parallel to the optical axis of the said lenses impinge upon the mirror areas, are focused to a point within said substrate and pass back through said lenses to be externally diffused, while light rays arriving at an angle not substantially parallel to the optical axis of said lenses impinge upon the light absorbing areas and are absorbed;

wherein the thickness and refractive index of said transparent substrate and the focal length of said lenses are selected so as to diffuse the reflected rays at the same angle as the range of observation.

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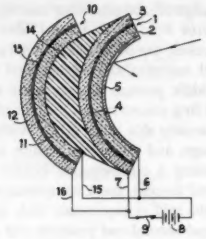
## 4,298,247
## THICK OPTICAL ELEMENT HAVING A VARIABLE CURVATURE

Guy Michelet, Paris, and Jean-Pierre Treton, Ste Genevieve des Bois, both of France, assignors to Quantel S.A., Orsay, France

Filed Apr. 1, 1980, Ser. No. 136,266
Claims priority, application France, Apr. 4, 1979, 79 08451
Int. Cl.[3] G02B *5/10*
U.S. Cl. 350—295 10 Claims

1. An optical element having a variable curvature and optical properties which vary as a function of that curvature, said element comprising a first bimorph structure which has at least one component member which is made from a piezoelectric material, first electrodes for applying a voltage to said bimorph structure to vary its curvature, at least one reinforcing piezoelectric bimorph structure, second electrodes for applying a voltage to the reinforcing bimorph structure and respectively connected to the first supply electrodes, the reinforcing bi-

morph structure having a component member adjacent a corresponding component member of the first bimorph structure, and a layer of elastic material which interconnects said adja-



cent component members and has a tensile strength which is low relative to the tensile strength of component members constituting the bimorph structures of piezoelectric material.

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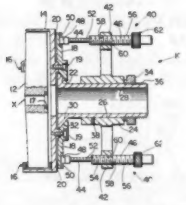
**4,298,248**

## PIVOTAL SUPPORT WITH INDEPENDENT ADJUSTING ELEMENTS AND LOCKING MEANS

**Roger H. Lapp, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed May 16, 1980, Ser. No. 150,389**
**Int. Cl.³ G02B *5/08***
**U.S. Cl. 350—310** **16 Claims**



1. A device for supporting optical elements and adapted for angular adjustment comprising:

a support element;

an optical element mount operably supported by said support element;

means for pivotally connecting said optical element mount to said support element having a locking and non-locking mode;

means for providing an adjusting surface connected with said optical element mount, said adjusting surface means being capable of limited flexure without significantly effecting the position or causing distortion of the shape of said optical element mount;

adjustment means movably connected to said support element and extending to said adjusting surface means for causing angular adjustment of the optical element mount;

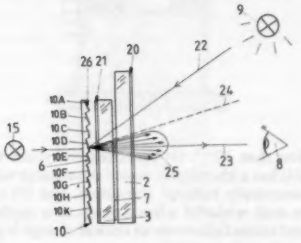
said pivotally connecting means including means for locking said pivotally connecting means whereby said optical element mount is substantially maintained in a fixed position relative to the support element in said locking mode.

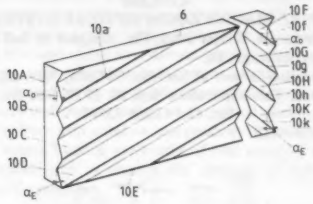
**4,298,249**

## ELECTRO-OPTICAL DISPLAY HAVING AN IMPROVED REFLECTOR AND METHOD OF MAKING

**Ernst Gloor; Meinolph Kaufmann, both of Fislisbach, Switzerland, and Allan R. Kmetz, Murray Hill, N.J., assignors to BBC Brown, Boveri & Company, Ltd., Baden, Switzerland**

**Filed Aug. 15, 1979, Ser. No. 66,696**
**Claims priority, application Switzerland, Dec. 20, 1978, 12925/78**
**Int. Cl.³ G02F *1/133***
**U.S. Cl. 350—338** **10 Claims**





1. An electroptical display with a vertical display plane, composed of parallel and planar front and rear cell plates, each of which is provided with electrode coatings, and between which is disposed a diplay medium, at least said front plate being transparent, comprising:

a thermoplastic reflector located on said rear cell plate and formed with a light reflecting structure comprising plural reflecting strips each inclined at an angle with respect to the plane of said plates and extending rectilinearly in at most two different directions over the surface of the reflector, said reflecting strips having reflecting surfaces which look upwardly to reflect light in a direction generally perpendicular to said front and rear cell plates so that ambient light from above the display is reflected to an observer located in front of the display, and the surface of said reflector adjacent said rear cell plate being at least partially diffusely reflecting;

wherein said angle $\alpha$ has a value in the range $20° \leqq \alpha \leqq 40°$.

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**4,298,250**

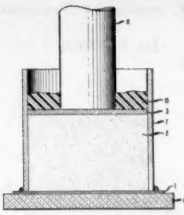
## SOLID ELECTROCHROMIC DEVICES

**Gary D. Boyd, Rumson, N.J.; Sarat K. Mohapatra, Acton, Mass.; Benjamin Tell, Matawan, N.J.; Sigurd Wagner, Evergreen, Colo., and Fred Wudl, Chester, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Oct. 31, 1978, Ser. No. 956,391**
**Int. Cl.³ G02F *1/17, 1/23***
**U.S. Cl. 350—357** **10 Claims**

1. A device comprising, (1) a solid electrochromic material, (2) a first and second electrode, said electrodes being in intimate contact with said electrochromic material and having means for applying an electric potential between said electrodes, (3) means for making electromagnetic radiation inci-

dent on said electrochromic material, and (4) means for observing an optical modification in said electrochromic material resulting from imposition of said electric potential CHARACTERIZED IN THAT said solid electrochromic material, (1) has a charge carrier from group I of the Mendelevian periodic table, (2) has an electronic transference number at room temperature less than $10^{-3}$, (3) has a resistivity less than $2\times10^{4}$ ohm-cm, (4) has a chemically bound constituent which undergoes an electrically induced coloration, and (5) comprises a polyhetero acid; whereby when a potential is applied between said first and second electrode an optical change is produced in said electrochromic material.



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**4,298,251**

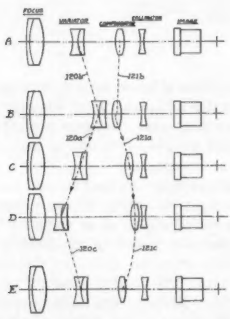
## DUAL MACRO ZOOM OPTICAL SYSTEM

**Rudolf Hartmann, Winter Park, Fla., assignor to Bell & Howell Company, Chicago, Ill.**

**Continuation-in-part of Ser. No. 744,835, Nov. 24, 1976, abandoned. This application Sep. 14, 1979, Ser. No. 75,653**

**Int. Cl.**[3] **G02B** *15/18*

**U.S. Cl. 350—428** **8 Claims**



**1**. A variable focal length optical system which is focusable within a normal range defined at one end by a normal telephoto condition and at the other end by a normal wide angle condition, and being continuously focusable refractively by repositioning of internal lens elements within a first macro range defined at one end by a macro wide angle condition and at the other end by the normal wide angle condition, and being continuously focusable refractively by repositioning of internal lens elements within a second macro range defined at one end by a macro telephoto condition and at the other end by the normal telephoto condition, said optical system comprising focusing lens means for focusing said optical system on an object located within the normal range, a zoom lens assembly including variator lens means, compensator lens means and a camming sleeve having a variator camming slot and a compensator camming slot, said variator lens means and said compensator lens means being located in said camming sleeve and being mutually displaceable therein in a predetermined relationship for varying the focal length of said optical system, and collimator lens means for collimating rays from said compensator lens means and occupying a fixed position in said optical system irrespective of the focal length thereof, said variator lens means and said compensator means occupying predetermined positions corresponding to the various conditions of said optical system and which maintain the object distances finite throughout the range of said positions, said variator lens means including a variator holder, a variator lens group mounted therein, and a variator pin protruding therefrom and into said variator slot, said variator slot having first and second end portions and a middle portion therebetween respectively corresponding to the first macro range, the axis of said second end portion of said variator slot lying substantially in a plane, the second macro range, and the normal range, said compensator lens means including a compensator holder, a compensator lens group mounted therein, and a compensator pin protruding therefrom and into said compensator slot, said compensator slot having first and second end portions and a middle portion therebetween respectively corresponding to the first macro range and the second macro range and the normal range, the axis of said second end of portion of said compensator slot lying substantially in a plane, to permit continuous macro focusing at either end of the zoom range without extending the optical system beyond its normal focusing range length.

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**4,298,252**

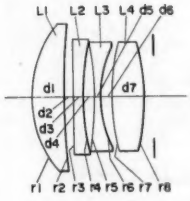
## REAR STOP TYPE LENS SYSTEM

**Yoshikazu Doi, Omiya; Takaaki Uchida, Iwatsuki, and Yutaka Sakai, Omiya, all of Japan, assignors to Fuji Photo Optical Co., Ltd., Japan**

**Filed Aug. 30, 1979, Ser. No. 71,046**

**Int. Cl.**[3] **G02B** *9/36*

**U.S. Cl. 350—470** **5 Claims**



**1**. A lens system wherein one convex meniscus lens **L1** having its convex surface directed toward the object side, two concave lenses **L3** and **L2** each having a concave surface of small radius of curvature directed toward the image side and one biconvex lens **L4** are arranged in the order mentioned from the object side and a diaphragm is positioned immediately to the rear of the lens **L4**, which lens system is characterized by satisfying the following requirements:

$$0.4 < 1/r2 - 1/r3 < 0.8,\ -0.2 < -\frac{1}{f3} < 0.2 \quad (1)$$

$$1.0 < 1/r6 - 1/r7 < 1.5 \quad (2)$$

$$2.4 < 1/r1 < 3.2 \quad (3)$$

$$1.7 < N1,\ N4 \quad (4)$$

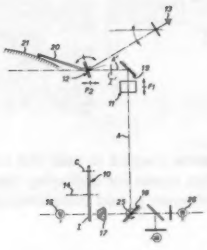
wherein **r1**, **r2**, **r3**, **r6** and **r7** denote the radii of curvature respectively of the first, second, third, sixth and seventh surfaces and **N1** and **N4** denote the refractive indices respectively of the lenses **L1** and **L4**.

4,298,253

## METHOD AND APPARATUS FOR PRESENTING TEST IMAGES AT DIFFERENT DISTANCES FROM A SUBJECT

Luc A. Tagnon, Saint Mande, France, assignor to Essilor International, "Cie Generale d'Optique", Creteil, France

Filed Oct. 2, 1979, Ser. No. 81,149
Claims priority, application France, Oct. 5, 1978, 78 28452
Int. Cl.[3] A61B 3/02
U.S. Cl. 351—17 10 Claims



2. Apparatus for presenting test images to a subject at different distances but for a constant visual acuity, said apparatus comprising a test holder member, a lens system for forming an image of a test indicia carried by said test holder member, a reflecting element for directing the test image towards the subject, means for adjusting the position of said lens system along its optic axis, and means for adjusting the position of said reflecting element along an axis parallel to a continuation of said optic axis of said lens system, and means for coordinating the adjustment of the positions of said lens system and said reflecting element so as to maintain the visual angle for the subject constant.

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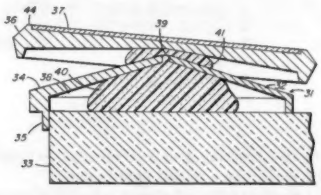
4,298,254

## DEVICE FOR REAR VIEW VISION FOR SPECTACLES

Cornelius Reddick, 2 Forest St., Boston, Mass. 02119

Filed Apr. 25, 1979, Ser. No. 33,103
Int. Cl.[3] G02C 7/14, 9/04
U.S. Cl. 351—50 2 Claims



1. Rearview reflection means for spectacles comprising:
a mounting base having a base surface shaped to fit against the rearward surface of a spectacle lens,
securing means to secure the base surface against a spectacle lens,
a reflection surface,
a support member for said reflection surface joining said reflection surface to said mounting base approximately parallel with the base surface of said mounting base, said support member and mounting base being two separate elements adapted to be fixed together by means of an adhesive, said adhesive being originally a putty-like pad adapted to harden to a rigid mass, whereby said support member is originally adjustable to provide that the reflection surface can be adjusted to a desired rearward viewing angle.

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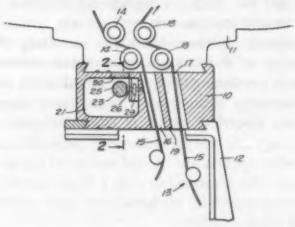
4,298,255

## APPARATUS FOR PREFLASHING MOTION PICTURE FILM

Robert E. Gottschalk, Los Angeles, Calif., assignor to Panavision, Incorporated, Tarzana, Calif.

Filed Jul. 14, 1980, Ser. No. 168,518
Int. Cl.[3] G03B 21/32
U.S. Cl. 352—85 14 Claims



1. Apparatus for preflashing unexposed motion picture film as it travels from a film magazine into the housing of a motion picture camera, comprising in combination: wall means forming a cavity, a light source within said cavity, a translucent rod extending into said cavity and having a portion exposed to said light source, said rod having an opaque lateral surface interrupted along one side by an axially extending light transmitting window, said wall means having an elongated opening through which light from said window can preflash the motion picture film, and means located exteriorly of said cavity for moving the translucent rod to change the amount of light passing through said opening.

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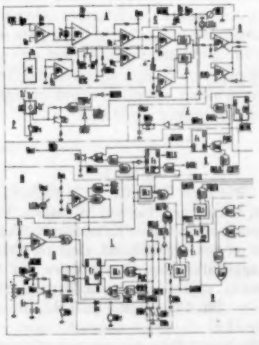
4,298,256

## EXPOSURE CONTROL DEVICE FOR CAMERA

Masaharu Kawamura, Kawasaki; Yoshihiro Shigeta, Tokyo; Masanori Uchidoi, Yokohama; Yoji Sugiura, Yokohama, and Hiroshi Yamamoto, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 913,544, Jun. 8, 1978, abandoned. This application Jan. 16, 1979, Ser. No. 3,854
Claims priority, application Japan, Jun. 15, 1977, 52-70748
Int. Cl.[3] G03B 7/093, 15/05
U.S. Cl. 354—23 D 3 Claims



1. An automatic exposure control device for a camera capable of permitting flash photography, said device comprising:
exposure computing means for natural light photographing,

said computing means arranged to generate an exposure signal corresponding to the brightness of an object to be photographed;

exposure computing means for flash photographing, said computing means being arranged to generate an exposure signal suitable for a flash photographing operation;

exposure control means for performing exposure control in response to one of the exposure signals generated by said natural light photographing exposure computing means and said flash photographing exposure computing means;

change-over means for applying one of the exposure signals of the natural light photographing exposure computing means and the flash photographing exposure computing means to said exposure control means;

electromagnetic release means for actuating the internal mechanism of the camera, said release means being arranged to produce an electrical signal when it operates;

signal generating means which generates a selection signal until said electrical signal is applied thereto from said electromagnetic release means and generates an inhibition signal after application of said electrical signal;

a discharge tube arranged to emit a flash therefrom;

accumulating means for accumulating light emitting energy for said discharge tube;

detecting means for detecting the amount of said light emitting energy accumulated at said accumulating means, said detecting means being arranged to produce a detection signal when the accumulated amount of said energy reaches a predetermined value;

triggering means for enabling said discharge tube to emit a flash in response to the detection signal produced by said detecting means;

control means for bringing about a permissive state to enable said detecting means to produce a detection signal or an inhibitive state to inhibit said detecting means from producing the detection signal, said control means being arranged to bring about the permissive state when a selection signal is applied thereto from said signal generating means and bring about the inhibitive state when an inhibition signal is applied thereto; and

change-over control means for shifting said change-over means to have the exposure signal of said flash photographing exposure computing means applied to said exposure control means in response to the generation of the detection signal of said detecting means when the selection signal is generated by said signal generating means and to have the exposure signal of said natural light photographing exposure computing means applied to said exposure control means when the detection signal is not generated while there is generated said selection signal, said change-over control means further being arranged to hold said change-over means in a shifting state in such a way as to have the exposure signal of said natural light photographing exposure computing means applied to said exposure control means when said inhibition signal is generated by said signal generating means.

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**4,298,257**

## DISPLAY DEVICE FOR CAMERA

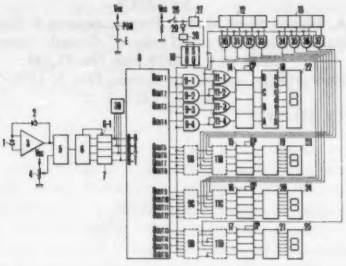
**Shoichi Togo, Fuchu, and Takeshi Miyashita, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 969,685, Dec. 14, 1978, abandoned.**
**This application Sep. 12, 1980, Ser. No. 186,477**
**Claims priority, application Japan, Dec. 22, 1977, 52-154621**
**Int. Cl.[3] G03B** *17/20, 17/36*
**U.S. Cl. 354—23 D** **7 Claims**

1. A display device for a camera comprising:

(a) a film counter circuit for providing a signal corresponding to camera film frame information;

(b) detection means for detecting an exposure operation and providing a completion signal when the exposure operation is completed; and



(c) display means coupled to said film counter circuit and said detection means for displaying the film frame information in response to said completion signal.

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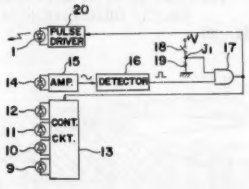
**4,298,258**

## DISTANCE MEASURING DEVICE

**Motonobu Matsuda, Kawachinagano; Tohru Matsui, and Yoshihiro Tanaka, both of Osaka, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan**

**Filed Aug. 23, 1979, Ser. No. 68,969**
**Claims priority, application Japan, Aug. 28, 1978, 53-104556**
**Int. Cl.[3] G03B** *3/10, 7/099*
**U.S. Cl. 354—25** **16 Claims**




1. A distance measuring device comprising, in combination:

means for projecting a pulsed light beam;

means for receiving the light beam reflected from an object to be measured, said light beam receiving means obtaining information of the zonal distance between the distance measuring device and the object to be measured by utilizing the difference in the incident angle of the reflected light beam;

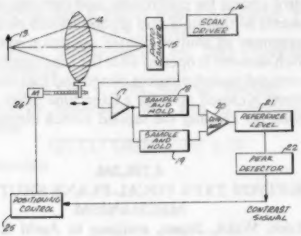
means for receiving ambient light and for generating a signal indicative of the change in brightness of the ambient light;

means connected to the ambient light receiving means for detecting the moment when the rate of change in brightness of the ambient light is relatively slow, and for generating a timing signal in dependence thereon, said detecting means operatively connected to the light beam projecting means for allowing the projecting means to project the light beam simultaneous with the reception of the timing signal.

## 4,298,259
## FOCUS DETECTING DEVICE FOR PHOTOGRAPHIC CAMERA

**Harumi Aoki, Kiyose, and Yoshio Sawada, Tokyo, both of Japan, assignors to Asaki Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Aug. 27, 1979, Ser. No. 70,165**
**Int. Cl.³ G03B *3/10***
**U.S. Cl. 354—25** **4 Claims**



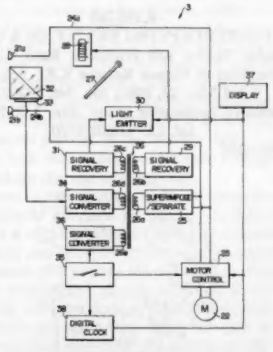

1. A focusing control circuit for a camera, or the like, having an objective lens, comprising:

a self-scanning photoelectric unit including an array of photoelectrical elements lying substantially in the image plane of the lens and means scanning the output of each of the elements in timed sequence to provide a series of pulses in timed sequence whose amplitudes correspond to the level of light on the respective elements, means switching successive pulses of said series alternately to two outputs, means converting the series of pulses at the two outputs to two analog signals, differential means receiving the two continuous analog signals for generating a continuous analog difference signal whose amplitude varies in proportion to the difference in amplitude of the two analog signals, and peak detector means responsive to said continuous difference signal for generating a maximum output when the lens is focused on the image plane.

## 4,298,260
## APPARATUS FOR ENDOSCOPIC PHOTOGRAPHY

**Syuichi Takayama, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Japan**

**Filed Mar. 17, 1980, Ser. No. 130,602**
**Claims priority, application Japan, Apr. 6, 1979, 54/42254**
**Int. Cl.³ G03B *7/083*; A61B *1/04*; G03B *15/03, 17/18***
**U.S. Cl. 354—50** **8 Claims**




1. An apparatus for endoscopic photography in which a camera is mounted on an endoscope and a light source unit is connected to the endoscope and a film winding d.c., motor located within the camera is interconnected with a d.c. power supply circuit located within said light source unit through d.c. feed lines disposed within said endoscope; said apparatus comprising:

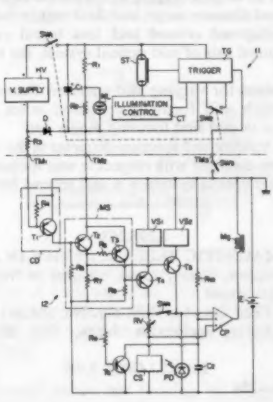
a signal conversion circuit for modulating a high frequency carrier signal with a first signal, and a superimposed circuit for superimposing said modulated high frequency signal on a d.c. signal and for placing said superimposed signal on said d.c. feed line, said signal conversion circuit and said superimposition circuit being located in one of said camera and said light source unit;

a separator circuit coupled to said d.c. feed lines for separating said modulated high frequency signal from said d.c. signal, and a signal recovery circuit for receiving and demodulating said separated modulated high frequency signal so as to recover said first signal, said separator circuit and said signal recovery circuit being disposed in the other of said camera and said light source unit, thereby allowing a communication of said first signal between said camera and said light source unit through the d.c. feed lines.

## 4,298,261
## CAMERA AUTOMATICALLY SYNCHRONIZED WITH AN ELECTRONIC FLASH

**Masahiro Kitagawa, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan**

**Filed Oct. 9, 1979, Ser. No. 82,793**
**Claims priority, application Japan, Oct. 13, 1978, 53-125874**
**Int. Cl.³ G03B *15/03***
**U.S. Cl. 354—139** **8 Claims**




1. Apparatus for automatically synchronizing a camera having an electrical shutter and an automatic photographing mode of operation with an electronic flash energized as a function of accumulated charging current, said apparatus comprising:

switching means for selectively establishing first and second exposure modes for said camera, one of said exposure modes automatically establishing an exposure period for said electrical shutter commensurate with and synchronized to the operation of said electronic flash and another of said exposure modes establishing an exposure period appropriate to an automatic photographing mode of operation of said camera; and

means for detecting the initiation of charging current being applied to a main charging capacitor of said electronic flash and providing an output signal indicative thereof, said switching means being responsive to said output signal to automatically establish one of said first and second exposure modes for said camera.

**4,298,262**

## APERTURE DEVICE OF A LENS CAPABLE OF CLOSE PROXIMITY FLASH PHOTOGRAPHY

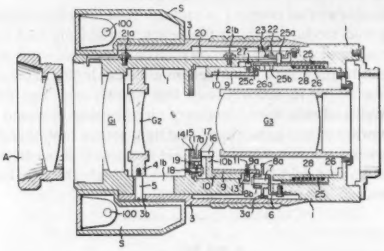
**Hideyo Nozawa, Ohmiya, and Hideshi Naito, Tokyo, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan**

**Filed Aug. 28, 1980, Ser. No. 181,978**

**Claims priority, application Japan, Sep. 14, 1979, 54/117322**

**Int. Cl.³ G03B *15/03, 3/00;* G02B *7/02***

**U.S. Cl. 354—139** **8 Claims**



**1.** In a lens barrel provided with a flash unit for irradiating an object and including a diaphragm for varying the aperture diameter and an optical system having a first focusing mode in which focusing operation can be effected with respect to an object lying within a predetermined distance range and a second focusing mode in which focusing operation can be effected with respect to an object lying at a distance shorter than said predetermined distance range, said flash unit including irradiating means disposed around said lens barrel symmetrically about the optical axis of said optical system, the improvement comprising:

control means for varying said aperture diameter in accordance with said focusing operation when said optical system is in said first focusing mode; and

means for holding said aperture diameter in the vicinity of its minimum diameter with respect to said focusing operation when said optical system is in said second focusing mode.

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**4,298,263**

## ELECTROMAGNETIC RELEASE DEVICE IN A CAMERA

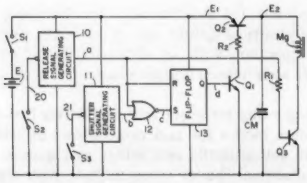
**Hiroshi Hasegawa, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan**

**Filed Dec. 18, 1979, Ser. No. 104,841**

**Claims priority, application Japan, Dec. 28, 1978, 53-178535[U]**

**Int. Cl.³ G03B *9/08***

**U.S. Cl. 354—234** **3 Claims**



**1.** An electromagnetic device for effecting exposure in a camera in response to a shutter release operation, comprising:

a shutter release device, a capacitor, a power source for charging said capacitor, and an electromagnet connected between the terminals of said capacitor for controlling said shutter release device,

switch means for selectively connecting said capacitor to said power source or said electromagnet, said switch means connecting said capacitor to said electromagnet in response to shutter release operation to thereby form a discharging circuit for said capacitor for a period of time other than the time needed for forming a capacitor charging circuit, or connecting said capacitor to said power source to thereby form the charging circuit for said capacitor, said switch means including:

a first switch element connected between said power source and said capacitor;

a second switch element connected between said electromagnet and said capacitor; and

a control circuit for controlling said first and second switch elements so that only said second switch element is closed in response to shutter release operation and said second switch element is opened after the time needed for keeping the second switch element closed and that said first switch element is closed only for a fixed time other than the time needed for keeping the second switch element closed.

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**4,298,264**

## SINGLE-PIVOT TYPE FOCAL-PLANE SHUTTER DRUM MECHANISM

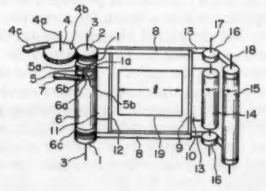
**Haruo Ishii, Wako, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed May 2, 1980, Ser. No. 146,917**

**Claims priority, application Japan, May 25, 1979, 54-64653**

**Int. Cl.³ G03B *9/32***

**U.S. Cl. 354—242** **5 Claims**



**1.** A single-pivot type focal-plane shutter mechanism comprising: a top curtain drum having a first protrusion extending therefrom; a bottom curtain drum having a second protrusion extending therefrom, said top and bottom curtain drums being rotatable around a common shaft; and an engaging ring having third and fourth protrusions which are engagable through rotation with said first and second protrusions on said top and bottom curtain drums, said engaging ring being rotatably mounted on said common shaft.

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**4,298,265**

## LIGHT-INTERCEPTING DEVICE IN A CAMERA

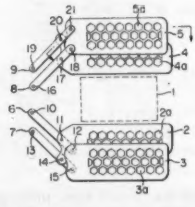
**Etsuo Tanaka, Tokyo, and Hironobu Kato, Urawa, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan**

**Filed May 23, 1980, Ser. No. 152,603**

**Claims priority, application Japan, Jun. 2, 1979, 54/69082**

**Int. Cl.³ G03B *9/40***

**U.S. Cl. 354—246** **4 Claims**



**1.** In a light-intercepting device in a camera including a plurality of flat light-intercepting vanes disposed on a light-

intercepting plane crossing an optical path, said light-intercepting vanes being driven so as to be parallel-moved relative to each other on said light-intercepting plane to thereby control the quantity of light passed therethrough, the improvement of said light-intercepting vanes comprising:

a substrate formed of titanium or a titanium alloy; and

a hardened layer of titanium compound formed on the surface of said substrate.

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**4,298,266**

## INTERCHANGEABLE LENS FOR CAMERAS, SUCH AS REFLEX CAMERAS

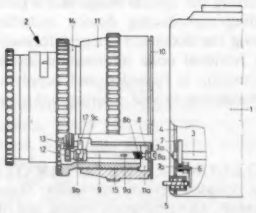
**Christian Ludwig, Dreissentalstr. 54, 7082 Oberkochen, Fed. Rep. of Germany**

**Filed Oct. 6, 1980, Ser. No. 194,640**

**Claims priority, application Fed. Rep. of Germany, Oct. 13, 1979, 2941601**

**Int. Cl.³ G03B *17/00, 9/00***

**U.S. Cl. 354—286** **7 Claims**



5. Interchangeable lens apparatus for attachment to cameras, such as reflex cameras, comprising

a lens assembly having a shutter portion arranged thereon for axial movement relative to the housing of the camera and adapted for accommodating a spring driven shutter sector drive,

cocking means arranged in the shutter portion and adapted for cocking the spring driven shutter sector drive,

a composite telescoping force transmission shaft operatively arranged for forward and reverse rotational movement as a cocking and release control means for the cocking means and including a cocking means associated first part and a camera drive associated second part, the first part being arranged for axial telescoping movement relative to the second part,

one telescoping shaft end comprising the end of the first part telescopingly remote from the second part and being drivably connected to the cocking means for cocking the spring driven shutter sector drive, and the opposite telescoping shaft end comprising the end of the second part telescoping remote from the first part and being adapted, upon interchangeable attachment of the lens assembly to the camera, for positive operative rotational engagement with a cocking button controllable drive shaft disposed in the adjacent portion of the camera, and

releasable lock bolt means operatively arranged for releasably locking the telescoping shaft,

the first part of the telescoping shaft comprising two mutually rotatable sub-parts including a lockable release sub-part and a cocking sub-part limitedly rotatable relative to each other and operatively arranged as coupling members for forward rotation in a shutter cocking direction and for reverse rotation in a shutter releasing direction,

the cocking sub-part having forward engaging means for operatively engaging the release sub-part in the forward shutter cocking direction of rotation of the cocking sub-part to rotate the release sub-part therewith during the cocking movement of the telescoping shaft, and the release sub-part having bolt receiving means arranged for operatively receiving the lock bolt means for releasably locking the release sub-part at the end of such cocking movement, and

the cocking sub-part further having release effecting means for operatively releasing the lock bolt means from the release sub-part in the initial movement phase of the reverse shutter releasing direction of rotation of the cocking sub-part, and the release sub-part further having reverse engaging means for operatively engaging the cocking sub-part to rotate the cocking sub-part therewith during the remaining movement phase of the sub-parts in the reverse shutter releasing direction of rotation.

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**4,298,267**

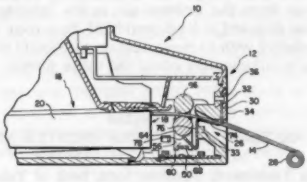
## PROCESSING ROLLER CLEANER

**Harvey S. Friedman, Sudbury, Mass., assignor to Polaroid Corporation, Cambridge, Mass.**

**Filed Jun. 24, 1980, Ser. No. 162,408**

**Int. Cl.³ G03D *5/02***

**U.S. Cl. 354—304** **4 Claims**



1. Apparatus for spreading a processing liquid across an exposed area of a photographic film unit so as to initiate the formation of a visible image therein while simultaneously advancing the film unit from its exposure position, said apparatus comprising:

a housing;

means mounted within said housing for supporting first and second elongate rollers in juxtaposed relation such that their peripheral surfaces define a pressure-generating gap into which an exposed film unit is adapted to be advanced;

first and second elongate rollers coupled to said supporting means in juxtaposed relation for rotation about their longitudinal axes, said first and second elongate rollers being adapted to spread a processing liquid across the width of an exposed film unit, as it passes therebetween, so as to initiate the formation of a visible image therein;

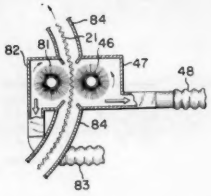
cleaning means mounted adjacent said first elongate roller and engageable with the peripheral surface of said first roller for removing particulate material from said peripheral surface as said first elongate roller is being rotated about its longitudinal axis; and

said supporting means includes means for supporting said first elongate roller for movement into engagement with said cleaning means as an exposed film unit is moved between said first and second elongate rollers, and out of engagement with said cleaning means as the film unit moves out from between said first and second elongate rollers.

## 4,298,268
## METHOD AND DEVICE FOR CLEANING PHOTOSENSITIVE SCREEN IN AN IMAGE FORMING APPARATUS

**Tadashi Sato, 24-20, Nishimachi 4-chome, Kokubunji-shi, Tokyo, and Keiji Tanaka, 506, Kuji, Takatsu-ku, Kawasaki-shi, Kanagawa-ken, both of Japan**

**Continuation of Ser. No. 549,437, Feb. 12, 1975, abandoned.**
**This application Sep. 29, 1978, Ser. No. 947,198**
**Claims priority, application Japan, Feb. 25, 1974, 49-22149; Jul. 27, 1974, 49-86379**
**Int. Cl.³ G03G *15/00***
**U.S. Cl. 355—3 SC** **4 Claims**




1. A method for protecting an endlessly movable photosensitive screen from an accumulation of dust, wherein the screen has a multitude of tiny openings for use in forming an image by modulating ion current and wherein the screen is disposed within a housing which also includes latent image forming means, and developing means for developing an image formed by modulating ion current, said method comprising:

substantially isolating the endlessly movable photosensitive screen from the ambient air in the housing with wall means disposed at least outside of the screen, but without interfering with its movement or with latent image formation, to substantially cover the entire screen.

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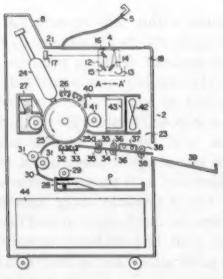
## 4,298,269
## RECORDABLE READER PRINTER AND ELECTROSTATIC COPIER

**Tomohisa Yoshimaru; Yasuhiro Sato, both of Yokohama, and Mitsuo Yamashita, Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan**

**Filed Sep. 18, 1979, Ser. No. 76,728**
**Claims priority, application Japan, Sep. 22, 1978, 53-117045**
**Int. Cl.³ G03G *15/00***
**U.S. Cl. 355—3 R** **6 Claims**



1. A recordable reader printer comprising:

a scanner for optically scanning each of a plurality of documents and producing document image information for the images of said individual documents;

means for producing retrieval code information respectively corresponding to said documents;

a recording/reproducing device including means for recording in a recording medium the document image information and retrieval code information corresponding to said documents respectively from said scanner and said retrieval code information producing means and a means for reproducing the recorded information from said recording medium;

means for inputting a retrieval code information corresponding to desired one of said image information for said documents;

means for detecting from said recording medium a document image information corresponding to the retrieval code information inputted by means of said retrieval code information input means and giving said recording/reproducing device a command for reproduction to read out the detected document image information from said recording medium; and

an electrographic printer including a means for converting at least the document image information reproduced by said recording/reproducing device into an optical image corresponding to the image of said document and a means for converting the optical image into a printed image;

said recording/reproducing device including means for reproducing the document image information and corresponding retrieval code information immediately when said information is recorded and supplying said reproduced information to said electrographic printer.

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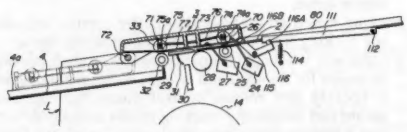
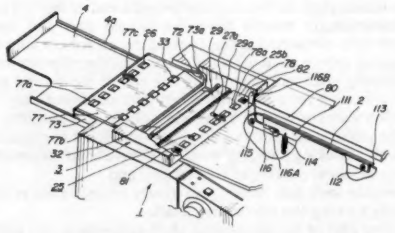
## 4,298,270
## ELECTROGRAPHIC APPARATUS

**Hiroshi Tsuda, Mitaka; Kiyoshi Miyashita; Masaji Nishikawa, both of Hachioji; Akira Shimizu, Fuchu, and Muneo Kasuga, Hachioji, all of Japan, assignors to Olympus Optical Company Limited, Tokyo, Japan**

**Filed Jan. 29, 1980, Ser. No. 116,391**
**Claims priority, application Japan, Feb. 2, 1979, 54/11134**
**Int. Cl.³ G03G *15/00***
**U.S. Cl. 355—3 SH** **19 Claims**





1. An electrographic apparatus comprising a main body with a manuscript carriage table; a manuscript discharge tray detachably mounted on said main body; a slit light exposure portion mounted on said main body and interposed between said manuscript carriage table and said manuscript discharge tray, said slit light exposure portion defining a substantially rectilinear manuscript feed path and projecting a manuscript image therethrough; a manuscript feed mechanism including upper and lower feed mechanisms arranged above and below said manuscript feed path at said slit light exposure portion, said upper feed mechanism being arranged movably with

respect to said lower feed mechanism; a photosensitive body for memorizing said manuscript image projected through said slit light exposure portion thereon as an electrostatic latent image; a sheet manuscript edge guide for determining a position of a side edge of a sheet manuscript; a thick manuscript edge guide for determining a position of a side edge of a thick manuscript, said thick manuscript edge guide being arranged outside said sheet manuscript edge guide viewed in a direction perpendicular to said manuscript feed path; and a means for automatically changing said two edge guides in response to a movement of said upper feed mechanism with respect to said lower feed mechanism; the apparatus being constructed and arranged such that in the case of obtaining copies of a sheet manuscript said sheet manuscript is fed by said manuscript feed mechanism under a condition that said upper feed mechanism is mounted on said lower feed mechanism and in the case of obtaining copies of a thick manuscript a thick manuscript carriage on which is disposed said thick manuscript is fed along the manuscript carriage table by said lower feed mechanism under a condition that said upper feed mechanism is moved from said lower feed mechanism.

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**4,298,271**

## SCANNING AND PROJECTING DEVICE

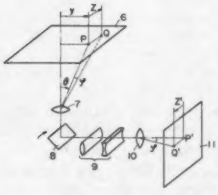
**Muneharu Sugiura, Tokyo; Kazuo Minoura, Yokohama, and Setsuo Minami, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Jul. 2, 1979, Ser. No. 53,777**

**Claims priority, application Japan, Jul. 6, 1978, 53-82279**

**Int. Cl.³ G03G *15/28;* G03B *27/70, 27/68***

**U.S. Cl. 355—8** **12 Claims**



**11.** An optical system for reproduction, comprising:

(a) a rotationally symmetrical first image forming optical system;

(b) a flat image original plane disposed on one focal plane of said first image forming optical system for subjection to slit-scanning;

(c) a deflector to deflect in a predetermined direction a light beam from said image original plane and which passes through said first image forming optical system, said deflector performing its deflecting function by a deflecting and reflecting surface which rotates about a predetermined axis;

(d) a second image forming optical system to collect the light beam from said deflector;

(e) a photosensitive medium disposed at a position where the light beam is collected by said second image forming optical system; and

(f) an anamorphic optical system interposed between said image original plane and the photosensitive drum, and provided with means for making the image forming magnification the same in both the scanning direction and the direction orthogonal thereto, and said second image forming optical system including means for maintaining constant the image forming magnification which would otherwise change with the change in rotational angle of the deflector.

**4,298,272**

## DAYLIGHT REPROGRAPHIC CAMERA

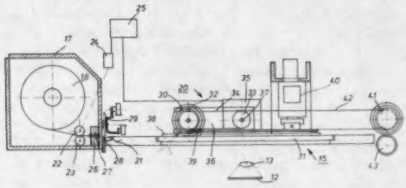
**Emile F. Stievenart, Hoboken, and Hugo F. Deconinck, Deurne-Zuid, both of Belgium, assignors to AGFA-Gevaert N.V., Mortsel, Belgium**

**Filed Nov. 21, 1979, Ser. No. 96,497**

**Claims priority, application United Kingdom, Nov. 23, 1978, 45765/78**

**Int. Cl.³ G03B *29/00***

**U.S. Cl. 355—28** **11 Claims**



**1.** A reprographic camera for waste-free exposure of photosensitive material under daylight conditions comprising a camera body having a fixed defined image plane and a light-tight casing mounted on its rear-side spaced from said image plane, a supply roll of a continuous web of photosensitive material situated within said casing, dispensing means associated with said casing for advancing outside said casing a selected variable length of the web of photosensitive material from said supply roll, severing means situated between said dispensing means and said image plane for separating from the material web the thus-advanced adjustable length thereof, transport means downstream of said severing means for transporting said severed variable length of material to an exposure position within the image plane of said reprographic camera, separate time-controlled synchronous motors for operating said dispensing means and transport means respectively at substantially fixed rates, and control means for energizing said synchronous motors for lengths of time which are a function of the selected variable length of material to be exposed.

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**4,298,273**

## PROJECTION ALIGNER AND METHOD OF POSITIONING A WAFER

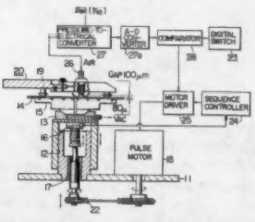
**Hiroshi Nishizuka, Kodaira; Susumu Komoriya, Tachikawa; Koyo Morita, Higashimurayama, and Takayoshi Osakaya, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Oct. 22, 1979, Ser. No. 87,387**

**Claims priority, application Japan, Oct. 20, 1978, 53-128367; Jun. 22, 1979, 54-78213; Jul. 11, 1979, 54-86926**

**Int. Cl.³ G03B *27/52***

**U.S. Cl. 355—61** **29 Claims**



**1.** A projection aligner comprising an optical system for projecting a radiation pattern onto a surface of a semiconductor wafer and wafer positioning means for positioning and

holding said wafer at a focal plane of said optical system, said wafer positioning means comprising:

leveling means for effecting leveling of said wafer by moving upwardly or downwardly a wafer chuck supporting said wafer thereon,

reference level means including a plurality of leveling pads defining a reference plane and adapted to press said wafer rested on said wafer chuck against said reference plane to thereby establish parallelism of said wafer to said reference plane,

measuring means provided at least at a position on said reference plane in opposite and spaced relation with the surface of said wafer for measuring the distance of said wafer surface from said reference plane, and

drive control means for controlling operation of said leveling means in response to an output signal from said measuring means to thereby stop movement of said wafer chuck when a measured value represented by said output signal has attained a predetermined value corresponding to said focal plane of said optical system.

27. A method of positioning a wafer in a projection aligner including an optical system for projecting a radiation pattern onto a semiconductor wafer, comprising: for setting the wafer surface at a focal plane of said optical system, measuring concavity and convexity of said wafer surface; determining an imaginary plane on the basis of the results of said measurement at which the area of said wafer surface lying within the focal depth of said optical system will take a maximum when the imaginary plane is positioned in said focal plane; and displacing said wafer so that said imaginary plane coincides with said focal plane of said optical system.

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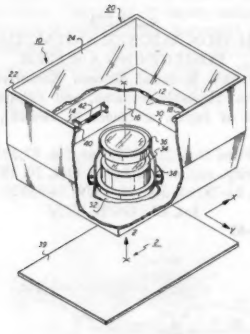
**4,298,274**

## VARIABLE DENSITY FILTER FOR A MULTI-MAGNIFICATION COPYING DEVICE

**James D. Rees, 5880 Palmyra Rd., Pittsford, N.Y. 14530; Kenneth W. Altfather, Jr., 9 Timway Ct., Fairport, N.Y. 14450; William L. Lama, 753 Blue Creek Dr., Webster, N.Y. 14580, and Donna U. Ozern, Shadow La., Amherst, N.H. 03031**

**Filed Jan. 7, 1980, Ser. No. 110,068**
**Int. Cl.[3] G03B *27/72***
**U.S. Cl. 355—71** **5 Claims**



1. A full frame, flash exposure optical system for a copier having magnification capabilities, including:

an object plane for supporting a document to be reproduced onto an imaging plane;

an illumination source for illuminating said object plane;

a lens for projecting an image of said object onto an imaging plane;

means for compensating for circularly symmetric exposure variation at said image plane said means comprising a variable transmission filter mounted in a fixed relation to said lens and having its center on the lens optical axis, said filter having an area of varying density which provides, for light passing therethrough, a radially symmetrical light transmission profile which is minimum at the center and which increases with distance from the center;

means for changing the magnification of said optical system said means at least effecting a translation of said lens and filter to maintain document registration;

wherein said filter maintains its position on the lens optical axis at any magnification position and compensates for said exposure variations throughout the magnification range.

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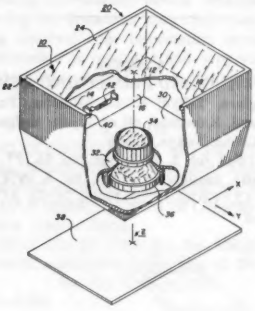
**4,298,275**

## RADIALLY VARYING TRANSMISSION FILTER FOR WIDE ANGLE COPYING DEVICE

**James A. Critchlow, Macedon, N.Y., and Donna U. Ozern, Amherst, N.H., assignors to Xerox Corporation, Stamford, Conn.**

**Filed Jan. 7, 1980, Ser. No. 110,062**
**Int. Cl.[3] G03B *27/72***
**U.S. Cl. 355—71** **6 Claims**



1. A full frame, wide angle exposure system for a copier wherein a platen is substantially uniformly illuminated by an illumination source said system including:

a lens for projecting an image of a document placed on said platen onto an imaging plane; and

a relative illumination filter positioned adjacent said lens and on the optical axis of said lens, said filter consisting of a disc having a central circular area of varying density which provides, for light passing therethrough, a symmetrical light transmission profile which is minimum at the center and which generally increases radially outward, said disc further having a transparent annular area encompassed by the outer edge of said central area and the outer edge of said disc, said transparent area providing maximum transmission light therethrough whereby said filter provides exposure compensation at said imaging plane for the effect of both $\cos^4$ variation as well as transmission variations and exit pupil distoration of said lens.

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**4,298,276**

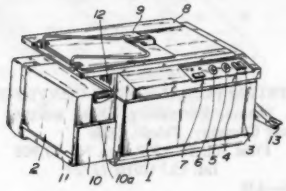
## CASSETTE TYPE ROLL SHEET FEEDING APPARATUS

**Hiroshi Tsuda, Mitaka; Kiyoshi Miyashita, Hachioji; Katsuhiko Kimura, Hachioji; Heihachi Arima, Hachioji, and Osamu Ishimoto, Hachioji, all of Japan, assignors to Olympus Optical Company Limited, Tokyo, Japan**

**Division of Ser. No. 918,822, Jun. 22, 1978, Pat. No. 4,218,135.**
**This application Dec. 10, 1979, Ser. No. 102,823**
**Claims priority, application Japan, Jun. 24, 1977, 52-74967; Jun. 24, 1977, 52-74968**
**Int. Cl.[3] G03B *27/58***
**U.S. Cl. 355—72** **3 Claims**

1. A cassette type roll sheet feeding apparatus for feeding a

roll sheet from a cassette after the roll sheet cassette is removably loaded in a copying machine body, comprising: a sheet guide provided in said roll sheet cassette disposed near a sheet outlet and having at least one opening; means for assisting the feeding of said roll sheet; said means are provided in the cassette at such a position that it faces the opening formed in said sheet guide to assist the feeding of the roll sheet through the outlet, said means being urged against the sheet guide through the leading end of roll sheet; and a sheet feed roller provided in



said copying machine body, said roller being adapted to project through said opening in the sheet guide, to hold a leading end portion of said sheet in cooperation with said means for assisting the feeding of the sheet from the outlet, when said cassette is mounted in the copying machine body; whereby, said sheet is held at the leading end portion thereof between said means for assisting the feeding of the sheet and said sheet guide, when said cassette is removed from the copying machine body.

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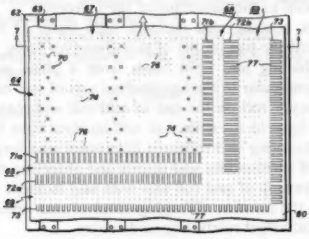
**4,298,277**

## GROOVED VACUUM BELT DOCUMENT HANDLING SYSTEM

**Morton Silverberg, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.**

**Filed Jan. 10, 1980, Ser. No. 111,051**
**Int. Cl.³ G03B** *27/62, 27/64*
**U.S. Cl. 355—76** **10 Claims**



1. For a document handling apparatus in which documents are moved with a vacuum belt to an imaging station of a copier, where the documents are imaged against a light reflective document imaging surface on a first side of said belt, and in which the documents are attracted to said first side of said belt by an air flow applied from a vacuum manifold at the second side of said belt through multiple vacuum apertures extending through the belt and opening on said first side, the improvement in said vacuum belt wherein:

said openings of said vacuum apertures are limited to areas of said first side of said belt coverable by the smallest document to be imaged thereagainst, to avoid show-around exposure of said apertures during said document imaging,

said first side of said belt has a multiplicity of vacuum channels recessed slightly below said light reflective document imaging surface thereof,

said vacuum channels having sufficiently gently sloping walls to avoid imaged edge shadows thereof at said imaging station and light reflective characteristics substantially equal to or better than said document imaging surface to avoid show-around imaging of said channels,

said openings of said vacuum apertures at said first side of said belt are recessed within said vacuum channels substantially spaced below said document imaging surface, and said vacuum channels pneumatically connect with said vacuum apertures and extend unapertured outwardly from and beyond said vacuum apertures over said document imaging surface of said belt, and

said vacuum apertures are sufficiently large to provide low impedance relatively unrestricted airflows therethrough into said vacuum channels, to provide airflows along said vacuum channels into said vacuum apertures from the direction of the edges of a document, and to thereby generate vacuum holddown forces along said channels between said document and said belt, whereby different sizes of documents may be vacuum retained on said document imaging surface without either said vacuum apertures or said vacuum channels being substantially imagable.

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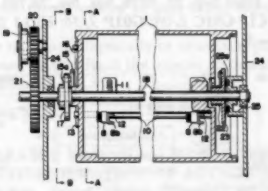
**4,298,278**

## DEVICE FOR DETACHABLY ATTACHING A MASTER SHEET TO A DRUM

**Hiroshi Katakura, Fuchu, and Takashi Tamura, Higashimine, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan**

**Filed Feb. 22, 1980, Ser. No. 123,837**
**Claims priority, application Japan, Feb. 25, 1979, 54-21251**
**Int. Cl.³ G03B** *27/04*
**U.S. Cl. 355—85** **2 Claims**



1. In a copying machine having a drum of the type in which a master sheet is detachably attached to the periphery of the drum, the machine which comprising; a rotary shaft connected to a drive member for supporting the drum; clutch means being provided between the drum and the drive member for rotating the drum so that the drum and the drive member undergo displacement relative to each other; a pair of fastening members mounted on the drum, movably, for attaching both ends of the master sheet onto the drum; wherein at least one of fastening members is moved from a fastening condition to removing condition by the relative displacement of the drum and the drive member.

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**4,298,279**

## COPYING APPARATUS HAVING AN ORIGINAL FEEDING MECHANISM

**Shigeru Yoshimura, Yokohama; Akihiro Nomura, Kawasaki, and Kimiaki Hayakawa, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

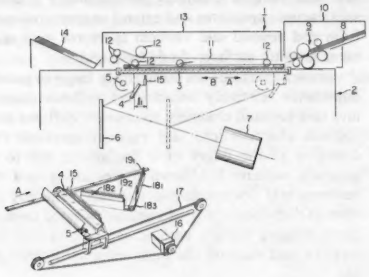
**Filed May 20, 1980, Ser. No. 151,675**
**Claims priority, application Japan, Jun. 1, 1979, 54-68563; Jun. 8, 1979, 54-72610; Jun. 26, 1979, 54-80306; Jun. 27, 1979, 54-82084; Jun. 28, 1979, 54-82472**
**Int. Cl.³ G03B** *15/00*
**U.S. Cl. 355—133** **5 Claims**

1. A copying apparatus having an original feeding mechanism having:

an original supporting member for supporting originals thereon;

original feeding means for conveying the originals onto the surface of said original supporting member;

discharging means for imparting a discharging action to said



original supporting member from that side thereof opposite to the original supporting side of said original supporting member to discharge the surface of said original supporting member; and

optical scanning means for optically scanning the original on said original supporting member.

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**4,298,280**

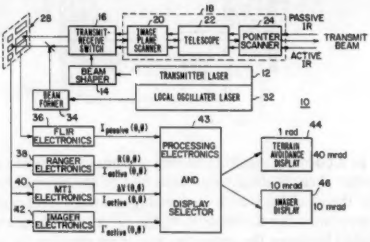
## INFRARED RADAR SYSTEM

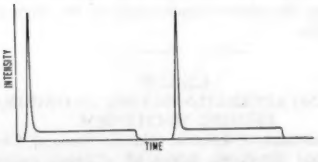
**Robert C. Harney, Acton, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.**

**Filed Sep. 25, 1979, Ser. No. 78,791**

**Int. Cl.³ G01C** *3/08;* **G01P** *3/36;* **H01J** *31/49*

**U.S. Cl. 356—5** **13 Claims**




1. An infrared radar system, comprising:

A. laser means for generating at least one infrared transmit pulse having a spike portion and a CW portion,

B. means for transmitting said pulse to a target scene,

C. receiver means for receiving reflections of said transmitted pulse reflected from objects in said scene, and for generating first signals representative of the received reflections of said spike portion, and second signals representative of the received reflection of said CW portion,

D. first processing means responsive to said first signals for generating data representative of the range of objects in said scene,

E. second processing means responsive to said second signals for generating data representative of the velocity of objects in said scene.

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**4,298,281**

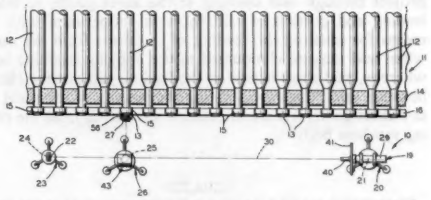
## LASER SYSTEM FOR ALIGNING CONVEYOR ROLLS

**Richard D. Schave, Perrysburg, Ohio, assignor to Libbey-Owens-Ford Company, Toledo, Ohio**

**Filed Jul. 16, 1979, Ser. No. 57,905**

**Int. Cl.³ G01B** *11/27*

**U.S. Cl. 356—138** **7 Claims**



1. A method of aligning each of a plurality of transversely extending, lohgitudinally spaced rotating conveyor rolls comprising the steps of:

(a) establishing a longitudinally extending reference plane containing the axes of the conveyor rolls:

(b) producing an incident light beam extending longitudinally along a path in said reference plane in parallel relationship to the centerline of the conveyor;

(c) first bending said incident light beam at right anges toward the end of one of said conveyor rolls;

(d) reflecting said light beam from a plane substantially perpendicular to the longitudinal axis of said one rotating conveyor roll on the end of said roll and rotating therewith back to the source of said incident light beam; and

(e) intercepting said reflected light beam on a target located at and surrounding said source and observing the angular relationship of said roll axis with said incident light beam from the position of impingement of said reflected beam on said target relative to said source.

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**4,298,282**

## GAUGE FOR MEASURING CARPET SOILING

**Keith Williams, 1820 H St., Fresno, Calif. 93721**

**Filed May 9, 1980, Ser. No. 148,137**

**Int. Cl.³ G01N** *21/88*

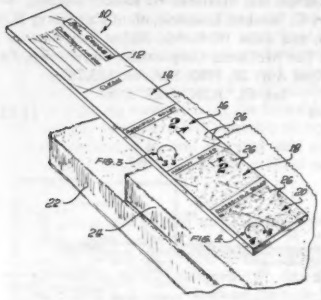
**U.S. Cl. 356—237** **7 Claims**

1. A soil gauge for measuring the relative amount of soiling of a carpet, said soil gauge comprising:

a transparent strip;

a plurality of viewing areas located in said strip, at least one of said viewing areas being covered with a multiplicity of small opaque marks positioned in said viewing area with adjacent viewing areas having an increasing coverage

whereby when a sample of unsoiled carpet is viewed through one of said viewing areas and matched with the



sample of soiled carpet, a relative measurement of degree of soiling is obtained.

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**4,298,283**

## INTERFEROMETRIC MEASURING METHOD

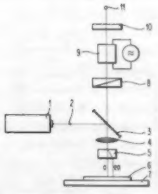
**Geunter Makosch, and Bernhard Solf, both of Sindelfingen, Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Nov. 13, 1979, Ser. No. 93,642**

**Claims priority, application Fed. Rep. of Germany, Nov. 30, 1978, 2851750**

**Int. Cl.³ G01B *9/02***

**U.S. Cl. 356—351** **17 Claims**



1. A interferometric method for analyzing the planarity of a surface, comprising

(a) generating two discrete coherent light beams each having at least one wavelength in common and polarized in different directions relative to each other,

(b) reflecting said beams from spaced surface portions into corresponding return beams,

(c) shifting the phase relation of the return beams to compensate for any phase shift resulting on reflection from said surface portions, and

(d) detecting said compensation for each common wavelength constituent as a function of the variations in the planarity of said surface.

**4,298,284**

## METHOD AND APPARATUS FOR MEASURING MAGNETOOPTIC ANISOTROPY

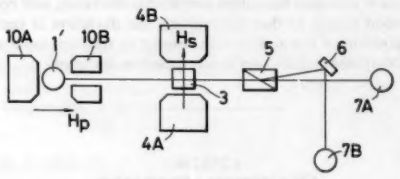
**Manabu Yamamoto, Odawara; Seiichi Murayama, Kokubunji; Masaru Ito, Kodaira, and Kounosuke Oishi, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Dec. 14, 1978, Ser. No. 969,268**

**Claims priority, application Japan, Dec. 14, 1977, 52-166953[U]**

**Int. Cl.³ G01N *21/21***

**U.S. Cl. 356—368** **2 Claims**




1. A apparatus for providing a measure of the concentration of a sample element by magnetooptic effect comprising:

means for providing a sample element on an optical path, said element having a given atomic resonance frequency,

means for subjecting said sample to a magnetic field transverse to said optical path,

means for supplying and directing at said sample and along said optical path a beam of light,

a polarizer on said optical path positioned to interrupt the emergent beam from said sample, and

means to detect said emergent beam after passing through said polarizer, the improvement in said beam supplying means comprising;

a light source radiating elliptically or circularly polarized light at a frequency shifted from the atomic resonance frequency of said element.

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**4,298,285**

## APPARATUS FOR MEASURING CONTOUR CONFIGURATION OF ARTICLES

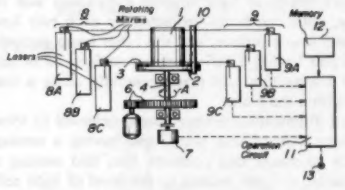
**Isao Ito, Nagoya, Japan, assignor to NGK Insulators, Ltd., Nagoya, Japan**

**Filed Jun. 15, 1979, Ser. No. 48,811**

**Claims priority, application Japan, Sep. 11, 1978, 53-110600**

**Int. Cl.³ G01B *11/24, 11/00***

**U.S. Cl. 356—376** **3 Claims**




1. An apparatus for measuring contour configuration of articles comprising;

a turn table on which the article to be measured is placed;

a detector for detecting a rotational angle of said turn table to produce a rotational angle signal;

an edge detector having a plurality of pairs of parallel light projecting members for projecting a parallel light onto the article and parallel light receiving members for receiving a part of the parallel light which is not shielded or cut by the article to produce an edge position signal, said parallel light projecting and receiving members being arranged on

respective sides of the turn table and arranged at different positions along the edge of article to be detected;

a memory for storing a standard edge position signal which corresponds to a standard article having given contour configuration and the maximum permissible tolerance of a deviation of a detected edge position signal from said standard edge position signal; and

an operation circuit for receiving said rotational angle signal, the edge position signal and the standard edge position signal and producing a signal which represents a deviation in the contour configuration of the article to be measured from the standard article by comparing the detected deviation with said maximum permissible tolerance, said operation circuit further determining the deviation in center position of the article with respect to the turn table and compensating for said center position deviation.

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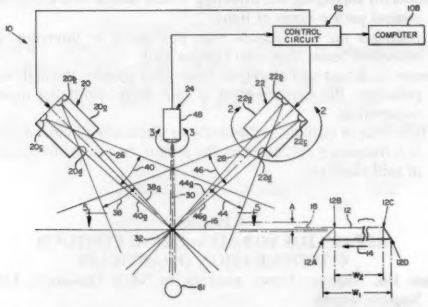
**4,298,286**

## MEASURING APPARATUS

**Carl W. Maxey, Corvallis, Oreg., and Warren Leyde, Seattle, Wash., assignors to The Carl Maxey Company, Corvallis, Oreg.**

**Filed Jun. 2, 1980, Ser. No. 155,500**
**Int. Cl.³ G01B *11/06***
**U.S. Cl. 356—381** **5 Claims**




2. Apparatus for measuring, within a definable selectively variable range, the distance between an object's surface and a datum plane, said apparatus comprising,

two pairs of illumination sources, each pair being oriented to project beams of light toward a common side of said plane, with one beam projected by each pair having a defined lower surface, and the other beam projected by each pair having a defined upper surface, all of said surfaces intersecting said plane generally along a common line within the plane,

reflected illumination sensing means oriented to view said common side of said plane, and having a sensing axis which intersects said common line, said sensing means producing a signal related to the level of light reflected thereto from an object's surface located along said axis, and

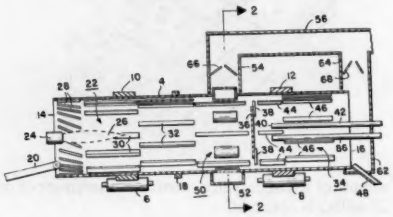
control circuitry operatively connected to said sources and to said sensing means, operable, with respect to said sources, to energize those sources projecting beams having defined lower surfaces alternately with the other sources, and with respect to said sensing means, to generate a signal indicative of the distance, if any, within said selected range, of such an object's surface from said plane, and of the side of said plane on which such surface is located.

**4,298,287**

## CENTER DRAFT ASPHALTIC CONCRETE DRUM MIXER

**Louis N. McCarter, III, Malvern; W. Robert Deemer, Norristown; Robert G. Meeker, Lansdale, all of Pa.; Harry B. Weaver, Goshen, and John W. Smith, Rising Sun, both of Ind., assignors to The McCarter Corporation, Norristown, Pa.**

**Filed Apr. 25, 1980, Ser. No. 143,787**
**Int. Cl.³ B28C *1/22, 5/00***
**U.S. Cl. 366—4** **11 Claims**



1. A method of preparing asphaltic concrete comprising introducing aggregate into a rotating drum, exposing the aggregate to heat in a first zone of said drum to effect drying of the aggregate while in said first zone, causing the aggregate to move to a second zone of the drum, introducing asphalt into the second zone of the drum, mixing the aggregate with asphalt in the second zone, and drawing air axially through said drum in the direction from said first zone toward said second zone, and characterized by the steps of drawing air from a third zone in said drum located between said first and second zones, drawing suspended particles produced in the drying step out of said drum along with the air drawn from said third zone, and at least temporarily isolating the suspended particles and air drawn out of said drum from said third zone from the asphalt and aggregate in said second zone.

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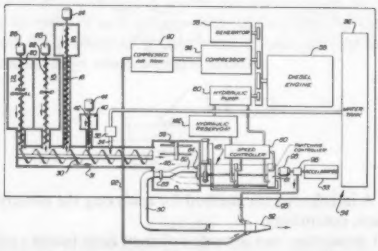
**4,298,288**

## MOBILE CONCRETING APPARATUS AND METHOD

**Alvin J. Weisbrod, Huntington Beach, Calif., assignor to Anthony Industries, Inc., City of Commerce, Calif.**

**Filed Jan. 25, 1980, Ser. No. 115,416**
**Int. Cl.³ B28C *7/10, 7/12, 7/14***
**U.S. Cl. 366—8** **12 Claims**



1. A mobile concreting apparatus for preparing a wet concrete slurry, from flowable solid ingredients therefor and water, and applying the wet slurry to a surface at a job site, the concreting apparatus comprising,

a plurality of containers, each adapted to contain one of the flowable solid ingredients,

a plurality of separate ingredient-feeding means, one for each ingredient, each of said ingredient-feeding means being connected to an associated one of said containers for

feeding the ingredient contained in said container therefrom,

a plurality of control means, each said control means being connected to an associated one of said ingredient-feeding means for individually controlling the feed rate thereof,

mixing means connected to said ingredient-feeding means for receiving and mixing the ingredients fed thereto,

water supply means connected to said mixing means for supplying water thereto at an individually controllable rate, said mixing means mixing the flowable solid ingredients and the water to a wet concrete slurry,

a vehicle connected to and carrying said containers, said ingredient conveyor means, said control means and mixing means;

a hose,

a nozzle connected to one end of said hose for applying concrete to the surface, and

pump means connected to said mixing means and the other end of said hose for pumping the wet concrete slurry through said hose at a feed rate which is controllable independently of the feed rates of said ingredients to said mixing means.

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**4,298,289**

## MIXING DEVICE

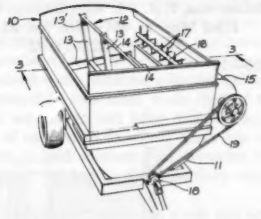
**Charles E. Walley, Cotton Abbotts, Waverton, Chester, England (CH3 5PH)**

**Filed Nov. 28, 1979, Ser. No. 98,360**

**Claims priority, application United Kingdom, Dec. 2, 1978, 46978/78**

**Int. Cl.³ B01F** *7/02, 15/02;* **A23N** *17/00*

**U.S. Cl. 366—196** **5 Claims**



1. A vehicle for the high speed mixing, transport and discharge of animal feedstuffs comprising:

(a) a non-tipping body having a top open for loading by way of an upper zone of the body and a part cylindrical lower zone defined by an unbroken curved floor and wall structure centered on a first longitudinal axis of the vehicle; said lower zone being below said axis;

(b) a main agitator rotatably driven about said first longitudinal axis in a cylindrical envelope of revolution and provided with longitudinal agitator bars which travel in close proximity to substantially the full axial extent of said curved structure to draw material contained in the body lower zone along said structure in its direction of curvature without any substantial component of movement in an axial direction;

(c) a laterally projecting extension to one side of the body upper zone and wholly above the level of the first longitudinal axis, which extension is open to the latter zone along the full length of the body, said extension being to that side of the body at which said material is operatively driven upwardly by said main agitator bars;

(d) a secondary agitator journalled within said extension for rotation about a second longitudinal axis, operatively driven in the same direction of rotation as the main agitator at a substantially higher speed of revolution, and provided with a series of randomly disposed radially projecting elements substantially along the full length of the extension whose radially outer ends intercept the path of movement of material after it leaves the lower zone to separate a proportion of the material from its main bulk and carry it into and around said extension with resultant upward displacement before returning said proportion into an upper region of the body upper zone without any substantial component of movement in an axial direction; and

(e) a discharge opening along substantially the full length of said extension which can be selectively opened to permit discharge of said material from the extension under the action of said agitators to one side of the direction of travel of the vehicle.

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**4,298,290**

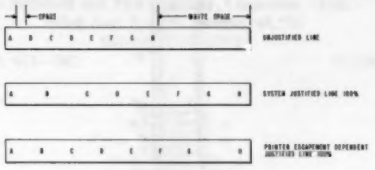
## SYSTEM AND PRINTER JUSTIFICATION SYSTEM

**Johnny G. Barnes; Patrick J. Hurley, and Gary W. Miller, all of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jun. 16, 1980, Ser. No. 159,552**

**Int. Cl.³ B41J** *5/30*

**U.S. Cl. 400—3** **10 Claims**



1. A system for justifying text lines made up of characters, words, and spaces, and to be printed with a printer having a minimum escapement unit differing from a minimum escapement unit for said system, said system comprising:

(a) means for scanning said line for determining a size of each word space in a line to be printed;

(b) means for dividing each determined word space size by said printer minimum escapement unit to obtain a quotient and any remainder;

(c) means for converting each determined word space size to a size including said quotient and accumulating said any remainder; and

(d) means for adding said accumulated remainder to a size of a word space on said line.

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**4,298,291**

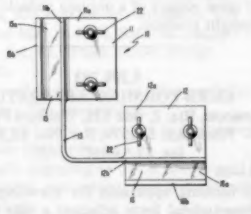
## CONNECTOR CLAMP

**Daniel L. Ward, Jr., 8671 Kumquat, Seminole, Fla. 33542**

**Filed Feb. 14, 1980, Ser. No. 121,466**

**Int. Cl.³ F16B** *1/00*

**U.S. Cl. 403—205** **7 Claims**



1. A connector clamp assembly for interconnecting modular display panels comprising

a clamp base including a pair of angle members having first and second legs normal to each other, a bridge member

integrally connected to the second leg of each angle member for bridging between the edges of adjacent panels;

a clamp angle connected to each angle member, having corresponding first and second leg elements;

said clamp angle being positioned to have said second leg element parallel to said second leg of said angle member to form a channel to receive the edge of said panel, and the first leg element being in juxtaposition to said first leg; and

adjustable fastener means connecting said first leg element and said first leg, whereby the width of said channel may be varied to securely clamp the corresponding edge of said panel and thereby interconnect the panels.

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**4,298,292**

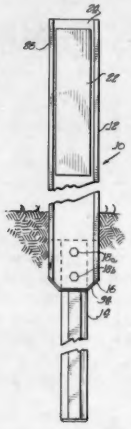
**TRAFFIC DELINEATOR**

**Lawrence J. Sweeney, Seneca, Pa., assignor to Franklin Steel Company, Franklin, Pa.**

**Filed Dec. 10, 1979, Ser. No. 101,439**

**Int. Cl.[3] E01F *9/00***

**U.S. Cl. 404—10** **23 Claims**



1. A traffic delineator assembly comprising:

a rigid anchor post drivable into the ground or roadway surface,

a rigid pilot plate drivable into the roadway surface attached to an upper end of said anchor post;

and an elongated flexible delineator member which is adapted to extend above the roadway surface attached to said pilot plate, the lower edge of said delineator lying generally adjacent to the lower edge of said pilot plate to follow said pilot plate into the roadway surface when said anchor post and said pilot plate are driven into the roadway surface, said delineator being sufficiently rigid to be unaffected by static conditions yet resiliently deformable to bend upon impact of a moving vehicle and spring back to an upright position.

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**4,298,293**

**CURB FORMING APPARATUS**

**Charlie J. Baucom, Rte. 2, Box 121, Webbers Falls, Okla. 74470**

**Filed Oct. 5, 1979, Ser. No. 82,311**

**Int. Cl.[3] E01C *11/28***

**U.S. Cl. 404—98** **10 Claims**

1. A curb forming apparatus for traveling along a single horizontal longitudinal form adjacent a side edge of a pavement comprising, in combination:

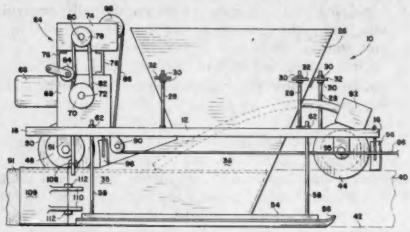
a frame having a front, rear, a first and second side members;

a plurality of aligned wheel means mounted to said first side member traveling upon said form;

a curb forming chute mounted within said frame adjacent said first side member and a lower portion thereof being adapted to slide against said form and said pavement;

means to bias said chute against said form;

a hopper means mounted to said frame above said chute and being provided with an opening in the lower portion thereof in communication with said chute;



a skid pad attached to said second side member, adapted to slide upon said pavement; and

propulsion means operatively related to said frame to propel said apparatus along said form.

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**4,298,294**

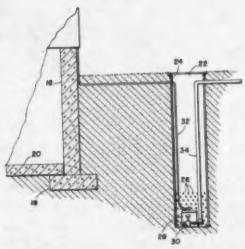
**BASEMENT DEWATERING SYSTEM**

**C. Lyle Zimmerman, R.R. #1, West Liberty, Iowa 52776**

**Filed Mar. 26, 1979, Ser. No. 23,543**

**Int. Cl.[3] E02D *31/02***

**U.S. Cl. 405—37** **4 Claims**



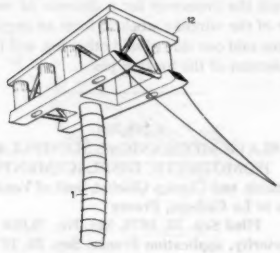
1. A drainage system for lowering the gravitational water level around a structure that is enclosed and extends below the ground, said system comprising means forming a vertical opening in the ground outside of and near said structure which opening extends from the surface of the ground to a level below the lowest level of said structure, said means including a lining of water-impervious material positioned inside of said vertical opening, said lining having a plurality of openings extending through it at its lower end to form a drainage access area extending below the lowest level of the structure, a submersible fluid pump located in said drainage access area at the lower end of said vertical opening, means responsive to the level of water in said vertical opening to start operation of said pump when said water level reaches a predetermined upper limit below the lowest level of the structure and to stop operation of said pump when said water level falls to a predetermined lower limit, and means connected to said pump to discharge water therefrom during the operation of the pump, said water being discharged at a substantial distance away from said structure.

**4,298,295**

## COMPOSITE FLEXIBLE CONDUIT FOR SUCKING LARGE VOLUMES OF SEA WATER FROM DEEP WATER BODIES

**Gian M. Bozzo, Treviso; Paolo Gava, Padua, and Antonio Paruzzolo, Venice, all of Italy, assignors to Tecnomare S.p.A., Venice, Italy**

**Filed Feb. 1, 1979, Ser. No. 8,481**
**Claims priority, application Italy, Mar. 3, 1978, 20833 A/78**
**Int. Cl.³ F02D *21/00*; E02B *9/00***
**U.S. Cl. 405—52** **5 Claims**



**1**. In a power station which exploits the temperature differential between the bottom and the surface of a body of water to produce power,

a substantially flexible conduit connected to the station at the surface of the body of water, wherein said conduit extends essentially vertical in the body of water, comprising:

a sequential array of essentially vertical cylindrical sections of a resilient material though which water is conveyed from the bottom of the body of water, and annular stiffening hoop members, each of which has inner and outer annularly spaced walls, wherein adjacent cylindrical sections are secured to said inner walls thereof to thereby connect said sections to said hoop member, and wherein the weight of said hoop members gives the cylindrical configuration to said sections and provides weight for maintaining said conduit in the essentially vertical position, and

a plurality of flexible cables arranged about said sections and hoop members parallel to the central axis of said conduit, wherein said cables are secured to said outer walls of said hoop members, and wherein said cables absorb stresses which would otherwise stress said cylindrical sections.

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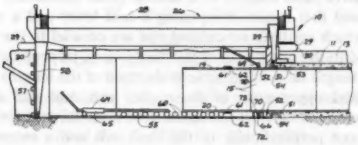
**4,298,296**

## FORM HANDLING SYSTEM

**Raymond A. Hanson, P.O. Box 7400, Spokane, Wash. 99207**

**Filed Oct. 4, 1979, Ser. No. 81,661**
**Int. Cl.³ E02D *29/10*; E03F *3/06***
**U.S. Cl. 405—146** **24 Claims**



**1**. A system for forming an elongated monolithic concrete conduit within an excavation with releasably interconnected collapsible hollow inner form sections extending in a static line from a rearward end to a forward end comprising:

slipform means for receiving and directing wet concrete about the interconnected inner form sections;

drive means for moving the slipform means forwardly within the excavation as concrete is delivered to the slipform means;

form section transporter means for successively:

(a) collapsing a form section at the rearward end of the interconnected form members; (b) moving the collapsed form section forwardly through the remaining interconnected sections to the forward end of the static line; (c) re-expanding the collapsed form section for connection at the forward end of the static line; and (d) returning to the rearward end of the static line to collapse the next successive form section;

steering means for guiding the transporter means along within the static line of interconnected inner form sections; and

form cleaning means ahead of the slipform means for washing the successive inner form sections forward of the slipform means.

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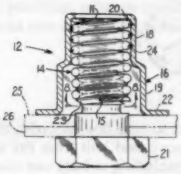
**4,298,297**

## LOCK NUT

**Richard B. Courson, Grosse Pointe Park, Mich., assignor to Almo Manifold and Tool Company, Centerline, Mich.**

**Filed Aug. 7, 1979, Ser. No. 64,376**
**Int. Cl.³ F16B *37/12***
**U.S. Cl. 411—262** **14 Claims**



**1**. Improvement in a lock nut requiring a special removal procedure, said lock nut comprising a length of compression spring and a housing, the rear portion of said spring being disposed within said housing and being permanently fastened thereto, the front portion of said spring being unattached to and both disconnected and spaced from said housing and being freely movable for threadably engaging a bolt or the like of the same hand as the helix of said spring, the front end of said spring being closed out of the normal helix position and ground to form a flat planar end surface thereon so that, upon rotation of said lock nut, the front end of said spring will threadably engage and lock upon said bolt and so that, save for said special removal procedure, said lock nut cannot be unthreaded from said bolt, said special removal procedure consisting of lifting said ground and closed end off the bolt during unthreading of said lock nut.

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**4,298,298**

## REUSABLE WALL FASTENER

**Louis J. Pontone, 935 E. 32nd St., Brooklyn, N.Y. 11210**

**Filed May 5, 1980, Ser. No. 146,527**
**Int. Cl.³ F16B *35/04*, *37/00***
**U.S. Cl. 411—342** **12 Claims**

**1**. A reusable wall fastener for attaching articles to an apertured wall, and the like, comprising:

a bolt having head means at one end and retaining end means at an opposite distal end;

a nut threadingly engaging said bolt between its head means and its retaining end means, said nut including laterally extending wings;

said retaining end means including an enlarged end cap to prevent removal of said nut from said bolt;

said head means being secured to said one end of said bolt to capture said nut between said head means and said end cap;

an elongated toggle housing pivotally receiving said wings of said nut at a midsection of said toggle housing;

said toggle housing including a rectangular member having a base wall, sidewalls, and at least a portion of a forward wall opposite said base wall, both ends of said rectangular member being open to threadingly receive said bolt longitudinally therethrough, and an aperture provided in said base wall to permit said bolt to pass therethrough as said rectangular member pivots relative to said nut and said bolt engaged by said nut, said aperture further permitting said bolt to be threaded transversely through said toggle housing;

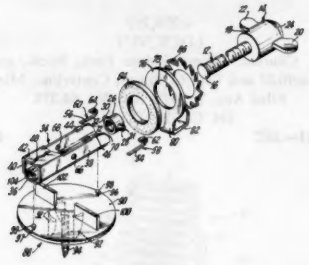
registered holes extending through said sidewalls of said toggle housing at said midsection for pivotally receiving said wings of said nut securely therein;

biasing means coupled between said toggle housing and said wings for biasing said toggle housing in a coaxial orientation with respect to said bolt in order to insert said bolt through and remove said bolt from the apertured wall;

said biasing means including at least one cane shaped biasing spring having an elongated leg portion longitudinally extending against said base wall of said toggle housing and a hook portion engaging an associated one of said wings of said nut; and

cam means on said toggle housing for engaging an inside face of the apertured wall to thereby pivot said toggle housing against the bias of said spring into a position transverse with respect to said bolt so that said toggle housing will engage the inside face of the apertured wall as the bolt is continuously threaded;

said cam means including rounded corners on said sidewalls of said toggle housing at a front end of said toggle housing spaced from said portion of said forward wall of said toggle housing.



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**4,298,299**

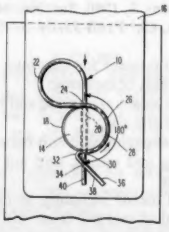
**HAIRPIN COTTER KEY**

**James R. Quarles, 801 Hill St., Springfield, Tenn. 37172**

**Filed Dec. 18, 1978, Ser. No. 970,133**

**Int. Cl.³ F16B *21/14***

**U.S. Cl. 411—514** **7 Claims**



1. A locking pin for safely, reliably, and quickly performing repeated assembly and disassembly in the shop and field, without special tools, mechanical abilities, and aptitudes, said device comprising:

(a) a single piece of wirelike stock having appropriate gauge, platings, and coating for the intended application;

(b) said wire having a bend therein to form two legs, one of said legs being of greater length than the other of said legs;

(c) said one of said legs having a bend therein to form an arcuate loop of generally semicircular shape and thereafter extending tangentially from said arcuate loop across one side of said other leg at an angle of substantially 90° and extending beyond the crossover for a distance of more than one diameter of the wirelike stock to form an angular bend and again cross said one side of said other leg, and form a crotch to aid insertion of the locking pin.

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**4,298,300**

**MASTER-SLAVE MECHANICAL MANIPULATOR WITH HOMOTHETIC DISPLACEMENTS**

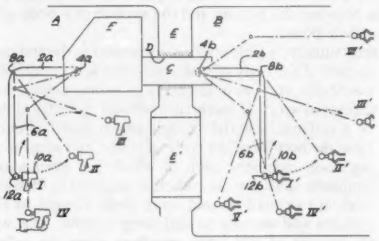
**Daniel Francois, and Charles Glachet, both of Vendome, France, assignors to La Calhene, France**

**Filed Sep. 24, 1979, Ser. No. 78,056**

**Claims priority, application France, Sep. 29, 1978, 78 27904**

**Int. Cl.³ B25J *3/02***

**U.S. Cl. 414—2** **12 Claims**



1. A master-slave manipulator having a master arm provided with a control handle and a slave arm controlled by the master arm and provided with a tool, said arms being connected by a shaft mounted in pivotal manner about a shaft axis with respect to a fixed support, the master arm and the slave arm each being of the articulated type and having an upper arm articulated about a shoulder axis perpendicular to the shaft axis and a lower arm articulated with respect to the upper arm about an elbow axis parallel to the shoulder axis, said manipulator comprising first means for defining a first point occupying a homethetic position of the control handle in a homothetic transformation of negative ratio relative to the shoulder axis of the master arm, and second means for placing said tool in a homothetic position of said first point in a homothetic transformation of negative ratio relative to a second point connected to the shaft, said first means comprising a first lever and a second lever which are both articulated and are parallel to the lower arm and to the upper arm of the master arm, respectively, and whose length ratio is the same as the ratio of the lengths of the lower and upper arms of the master arm, and said second means comprising a firt rod articulated to said first point about a first axis perpendicular to the shaft axis and a second rod having one end articulated to the first rod about a second axis parallel to the first axis and another end articulated to said second point about a third axis parallel to the first axis, means being provided to maintain one of the rods parallel to the upper arm of the slave arm and the other rod parallel to the lower arm of the slave arm, the ratio of the length of the rods being the same as the ratio of the lengths of the lower and upper arms of the slave arm.

**4,298,301**

## BALE HANDLING APPARATUS

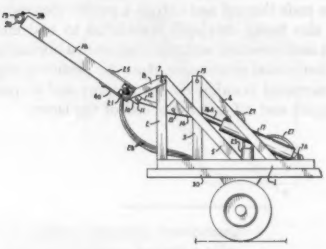
**Jackie L. Carter, R.R. 2, Lucerne, Mo. 64655, and Jerry D. Carter, 320 S. 19th St., Unionville, Mo. 63565**

**Continuation-in-part of Ser. No. 752,151, Dec. 20, 1976, Pat. No. 4,148,399. This application Dec. 19, 1978, Ser. No. 970,917**

**The portion of the term of this patent subsequent to Apr. 10, 1996, has been disclaimed.**

**Int. Cl.³ B65H *75/40***

**U.S. Cl. 414—24.6** **4 Claims**



1. A device for handling large round hay bales comprising:

(a) frame means mounted on the bed of a vehicle wherein said frame means comprises:

(1) a base portion mounted on said bed;

(2) a first and second plurality of upright portions mounted on said base portions and extending well above said bed and base portion;

(b) an elongated beam means pivotally mounted on said first plurality of upright portions in a horizontal relationship with respect to the earth; said beam means being mounted such that it may move along an arcuate path toward and away from the earth and about the pivotal mounting points on said upright portions;

(c) first power actuated means pivotally connected at one end to said frame means;

(d) linkage means pivotally mounted on said second plurality of upright portions of said frame and connected to the other end of said first power actuated means;

(e) connecting means connected to said linkage means and to said beam means;

(f) plural arm means pivotally mounted on said beam means;

(g) second power actuated means connected to said plural arm means for pivoting the ends of said plural arm means toward and away from each other, said second power actuated means being mounted in approximately parallel relation to and inside of said beam means;

(h) spike means mounted on the said arm means in perpendicular relationship to said arm means such that as ends of said arm means pivot toward each other with a hay bale therebetween, said spike means will engage, deform and penetrate said hay bale to enable the lifting thereof by said first power actuated means acting through said arm means, beam means, connecting means and linkage means.

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**4,298,302**

## APPARATUS FOR TAKING OUT AND FEEDING SINGLE V-SHAPED STRIPS

**Alberto Allievi, Milan, Italy, assignor to Amia di Adolfo e Alberto Allieve & C.S.N.C., Milan, Italy**

**Filed Oct. 1, 1979, Ser. No. 81,085**

**Claims priority, application Italy, Oct. 13, 1978, 28745 A/78**

**Int. Cl.³ B65G *59/06***

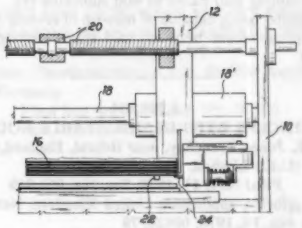
**U.S. Cl. 414—126** **14 Claims**

1. An apparatus for removing single metal strips from a package of such strips and for feeding said removed strips singly to a position of further utilization, each said strip comprising an elongated V-shaped member having an acute apex angle, said strips being nested together by friction contact between elongated arms of adjacent said strips with an elongated free space between apices of each adjacent pair of strips, thereby forming said package, said apparatus comprising:

storage means for storing therein a package of strips with the apices of said strips directed downwardly and such that said package is movable downwardly within said storage means due to gravity;

support means movable in opposite longitudinal directions orthogonal to the direction of the longitudinal axis of said package of strips between a first operative position, whereat said support means is beneath and supports said package by contact with the lowermost strip of said package, and a second inoperative position, whereat said support means is withdrawn from beneath said package;

separating means for separating said lowermost strip from said package and for allowing the thus separated strip to fall by gravity from said storage means, said separating means comprising a pair of longitudinal members positioned at opposite ends of said lowermost strip and having a common axis longitudinally coincident with the elongated free space between the apices of said lowermost strip and the next adjacent said strip, said pair of members having a facing conical ends, said members being simultaneously movable in opposite longitudinal directions between first inoperative positions whereat said conical ends are axially spaced from said elongated free space, second intermediate positions, whereat portions only of said conical ends extend into said elongated free space and support



said package by contact therewith at locations on said conical ends midway between opposite smaller and larger diameter end portions thereof, and third separating positions whereat the entire said conical ends extend into said elongated free space, each said conical end having a diameter at said location thereof contacting said package when in said second intermediate position not greater than the size of said elongated free space, whereby said lowermost strip remains in friction contact with said next adjacent strip, and the diameter of said larger diameter end portion of each said conical end being greater than size of said elongated free space, whereby when said members move to said third separating position said lowermost strip is forceably separated from friction contact with said next adjacent strip and falls by gravity from said storage means;

control means, operatively connected to said support means and to said separating means, for sequentially moving said members from said first inoperative position thereof to said second intermediate position thereof, moving said support means from said first operative position thereof to said second inoperative position thereof, whereby said package is supported by said members, moving said members from said second intermediate position thereof to said third separating position thereof, whereby said lowermost strip is separated from said package and falls by gravity from said storage means, and vice versa; and

means for receiving the thus separated said strip and for feeding said strip to a position of further utilization.

4,298,303

## DEVICE FOR TRANSPORTING AND STORING SPOOLS AND PARTICULARLY YARN SPOOLS

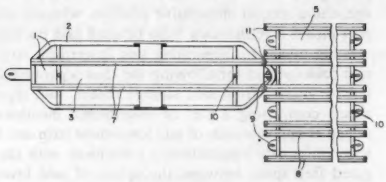
Josef Ritschel, Freiburg, Fed. Rep. of Germany, assignor to Rhodia AG, Freiburg im Breisgau, Fed. Rep. of Germany

Filed Sep. 5, 1979, Ser. No. 72,629

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1978, 2839296

Int. Cl.[3] B65G *67/00*

U.S. Cl. 414—401 8 Claims



1. A device for the take-up, storage and transportation of spools, particularly yarn spools, which comprises:

(a) a spool carriage (**1**) which consists of a subframe (**2**) and a spool rack (**3**), the subframe and the spool rack being connectable together and separable from each other;

(b) said spool rack being similarly connectable to a pallet (**5**) and being separable therefrom in the same manner;

(c) the pallet being engageable with the subframe (**9**) means for coupling said pallet to said subframe (**9**);

(d) the pallet being capable of take-up of several spool racks;

(e) coupling means between said spool carriage and said pallet.

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4,298,304

## VEHICLES WITH DEMOUNTABLE BODIES

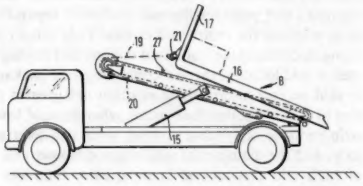
Anthony E. Jones, Frenchay, near Bristol, England, assignor to Brimec (U.K.) Limited, Avon, England

Filed Nov. 17, 1978, Ser. No. 961,818

Claims priority, application United Kingdom, Nov. 17, 1977, 22422/77; Jan. 10, 1978, 00826/78

Int. Cl.[3] B60P *1/14*

U.S. Cl. 414—492 3 Claims



1. A vehicle having a support for a demountable body, means for moving the support between a horizontal or substantially horizontal position and an inclined position in which one end thereof is higher than the other end thereof and means for mounting a body on the support and for demounting the body therefrom, wherein the mounting and demounting means comprises (a) an ended chain, guide means for the chain comprising a sprocket mounted on the support at or adjacent said one end thereof, the chain extending around a portion of the periphery of the sprocket and having a portion thereof extending from the sprocket along the support towards said other end of the latter, attachment means provided at the free end of said portion of the chain for connection to a demountable body, and drive means drivingly connected to the sprocket, the guide means also comprising a guide mounted on the support and arranged to guide the chain into engagement with the sprocket on turning of the latter by the drive means and to maintain it in such engagement as it passes around the sprocket, and the drive means being operable to cause the chain, with the support in an inclined position or a horizontal or substantially horizontal position, to draw a body on to said other end of the support and along the latter into a mounted position, and with the support in an inclined position, to control movement of a body under gravity from a mounted position downwardly along the support and off said other end thereof, and (b) an endless flexible linear element which extends around two direction-reversing means mounted on the support at or adjacent the respective ends thereof and carries a pusher element, said drive means also being drivingly connected to said endless linear element and operable, with the support in a horizontal or substantially horizontal position, to cause the pusher to engage a body in a mounted position on the support and to push it along the support and off said other end of the latter.

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4,298,305

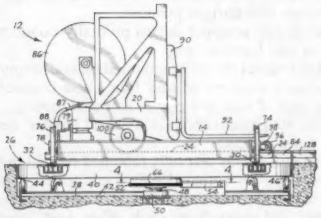
## METHOD AND APPARATUS FOR TRANSFERRING LOADS

Walter Neth, Vancouver, Wash., assignor to Columbia Machine, Inc., Vancouver, Wash.

Filed Nov. 22, 1978, Ser. No. 962,888

Int. Cl.[3] B60P *1/64*

U.S. Cl. 414—498 20 Claims



1. Apparatus for transferring a load between selected stations comprising:

transfer car means operable for selective shifting along a first predetermined path interposed between first and second stations;

orienting means positioned adjacent and fixed relative to said first predetermined path operable for selective rotation through a predetermined angular displacement, said orienting means including turntable means and power-driven means coupled thereto, said power-driven means being operable for angularly displacing said turntable means about a substantially vertical axis of rotation, said turntable means also including track means selectively alignable with said first predetermined path upon suitable positioning of said turntable means for receiving said transfer car means thereon; and

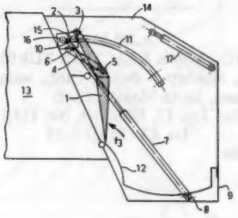
load carrier means operable for picking up and depositing a load, said load carrier means being mounted on and powered from said transfer car means and operable for reciprocative shifting thereon from a pre-spot position to load receiving and depositing positions, said load carrier means also being shiftable to positions remote from said transfer car means for selective positioning along a second predetermined path.

4,298,306

## APPARATUS FOR LOADING SOLID MATERIAL INTO A CONTAINER

Emile Chaudorge, Angerville, France, assignor to Chauoronnerie Tolerie Industrielle d'Angerrville "CTIA", France

Filed Sep. 14, 1979, Ser. No. 75,759
Claims priority, application France, Sep. 18, 1978, 78 26669
Int. Cl.[3] B65F 3/00
U.S. Cl. 414—525 R 10 Claims



1. A loading apparatus comprising:

a hopper, said hopper having a side;

a loading blade having a top and having a bottom edge, said bottom edge extending into said hopper;

moving means for moving said blade through said hopper between a first position in said hopper adjacent said side of said hopper and a second position below in said hopper and laterally displaced in said hopper from said first position and located farther from said side of said hopper; said moving means comprising guide means in said hopper and a slidable transverse beam disposed to move along said guide means and being free of any fixed connection to said hopper; said top of said blade being pivotally secured to said transverse beam at a first location; and said moving means further comprising first hydraulic cylinder means connected between said hopper and a second location on said transverse beam for moving said transverse beam along said guide means, said second location being below said first location when said blade is in said first position; and

pivoting means for pivoting said blade in said hopper between a third pivot position at which said blade bottom edge is pivoted nearer said hopper side and a fourth pivot position at which said blade bottom edge is pivoted farther from said hopper side; said pivoting means comprising second hydraulic cylinder means connected between said blade and a third location on said transverse beam that is below said first location when said blade is in said first position; at least one of said first and second hydraulic cylinder means being disposed generally below said transverse beam when said blade is in said first position.

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4,298,307

## AIR FLOAT POWER ROTATION SYSTEM

Raymond A. Bergman, 107 E. Second St., Minster, Ohio 45865

Continuation-in-part of Ser. No. 924,958, Jul. 17, 1978, Pat. No. 4,179,106, which is a continuation of Ser. No. 815,676, Jul. 14, 1977, abandoned, which is a division of Ser. No. 684,725, May 5, 1976, Pat. No. 4,058,885. This application Oct. 29, 1979, Ser. No. 88,772
Int. Cl.[3] B23Q 7/00
U.S. Cl. 414—676 20 Claims

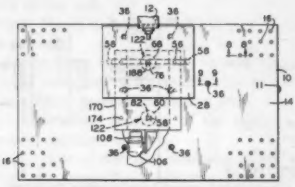
1. A pressurized fluid support system comprising:

a support table having a generally flat upper surface adapted for supporting a workpiece fixture thereon,

means for supplying a cushion of fixture supporting pressurized fluid to the surface of the table whereby a workpiece fixture may be floatingly supported thereon,

keying element means rotatably mounted within said table and having a portion thereof extending upwardly from said table under surface, the portion of said keying element means extending from the table surface having a non-circular cross-sectional shape within a plane parallel to the table surface whereby the keying element means is capable of keying to an overlying workpiece fixture,

means within said table for rotating said keying element means relative to said table about an axis normal to the upper surface of said table, and



a workpiece fixture having a lower surface supported on said table upper surface on the cushion of pressurized fluid, and including an opening in said lower surface keyed to said keying element means so that said fixture will be rotated by said keying element means,

said keying element means comprising a pin mounted for retraction to a position flush with or below the table upper surface.

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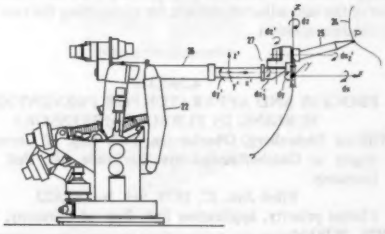
4,298,308

## APPARATUS FOR DETECTING FORCES DIRECTING THE MOVEMENT OF A MANIPULATING INSTRUMENT

Hans Richter, Oberlanderstrasse 123, D-8900 Augsburg, Fed. Rep. of Germany

Filed Sep. 24, 1979, Ser. No. 78,280
Int. Cl.[3] G05B 19/42; B25J 9/00
U.S. Cl. 414—730 33 Claims



1. In combination with a motor driven manipulating arm capable of movement along mutually perpendicular axes, an apparatus for programming said manipulating arm to precisely repeat a sequence of movements, said apparatus comprising:

a handle assembly including a center part rigidly attached to said manipulating arm for joint movement therewith, said handle assembly further including an outer sleeve portion surrounding said center part;

flexible coupling means for joining said outer sleeve to said center part while allowing limited relative movement therebetween; and,

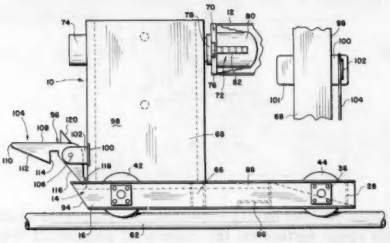
data transducer means mounted on said handle assembly for detecting forces acting on said outer sleeve and generating output signals indicative of the magnitude and direction of said forces, whereby said signals are employed to create a playback program directing said motor driven manipulating arm to repeatedly perform the same sequence of movements.

**4,298,309**

## PIPE CARRYING CARTS

**Woodrow W. Stoltz, P.O. Box 35103, Tulsa, Okla. 74135**

**Filed Apr. 30, 1979, Ser. No. 34,476**
**Int. Cl.³ B65H *51/00***
**U.S. Cl. 414—745** **3 Claims**



**1**. A wheeled vehicle for facilitating the transport of linearly arranged objects, said vehicle comprising main frame means, wheel means journalled on said frame means for moving said vehicle, pedestal means provided on said vehicle, object engaging and supporting means carried by the pedestal for receiving one end of the object, latching means provided on the vehicle for selective connection between a pair of adjacent substantially identical vehicles for coordinated operation between the said vehicles, and said wheel means comprising at least two pairs of axially aligned wheels with all wheels being in tracking position with respect to the other relatively positioned wheels, said latching means being carried by the pedestal means and cooperating with the latching means of said adjacent vehicle for a latching engagement in one relative position between the adjacent vehicles, said latching means comprising a bracket member rigidly secured to one outer wall of the pedestal means, flange means secured to the bracket member and disposed in spaced relation to the outer wall of the pedestal means, and a latch member pivotally secured to said flange means for selective engagement with the bracket member of the said adjacent vehicle for connecting the two vehicles in tandem relation.

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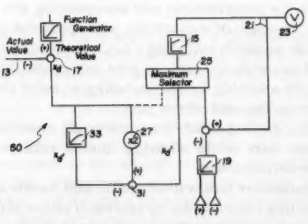
**4,298,310**

## PROCESS AND APPARATUS FOR PREVENTION OF SURGING IN TURBOCOMPRESSORS

**Wilfried Blotenberg, Oberhausen, Fed. Rep. of Germany, assignor to Gutehoffnungshütte Sterkrade AG, Fed. Rep. of Germany**

**Filed Jun. 27, 1979, Ser. No. 52,823**
**Claims priority, application Fed. Rep. of Germany, Jun. 27, 1978, 2828124**
**Int. Cl.³ F04D *27/02***
**U.S. Cl. 415—1** **9 Claims**




**1**. A process for the operation of a turbo-compressor having an output at an actual value of an operating parameter, and a blow-off valve for regulating the output to prevent surging of the output above a surge limit and to prevent a reduction of the output below a minimum value, with comparing means for measuring the actual value and comparing to a permissible theoretical value for the parameter, and controlling means for controlling the blow-off valve in accordance with an output from the comparing means, comprising: forming a first difference value between the theoretical value and the actual value, forming a delayed value from the difference value, forming a second difference value between the delayed value and the first difference value, and controlling the blow-off valve in accordance with the second difference valve.

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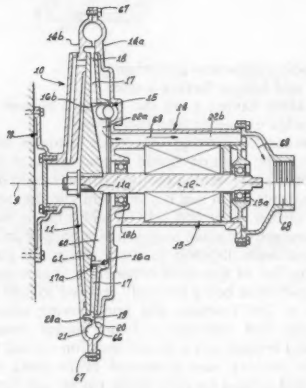
**4,298,311**

## TWO-PHASE REACTION TURBINE

**Emil W. Ritzi, Manhattan Beach, Calif., assignor to Biphase Energy Systems, Santa Monica, Calif.**

**Filed Jan. 17, 1980, Ser. No. 113,113**
**Int. Cl.³ F01D *1/18***
**U.S. Cl. 415—80** **19 Claims**



**1**. In a reaction turbine, the combination comprising
(a) first nozzle means to receive heated fluid for expansion therein to form a two-phase discharge of gas and liquid,
(b) a separator rotor having an axis and a rotating surface located in the path of said discharge for supporting a layer of separated liquid on said surface,
(c) the rotor having reaction nozzle means to communicate with said layer to receive liquid therefrom for discharge in a direction or directions developing torque acting to rotate the rotor.

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**4,298,312**

## DAMAGED VANE LOCATING METHOD AND APPARATUS

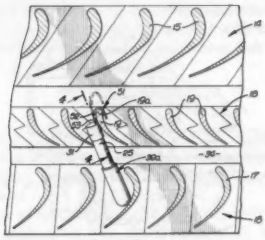
**Michael C. MacKenzie, Pasadena, and Reinhold S. Fischer, Los Angeles, both of Calif., assignors to Purex Corporation, Lakewood, Calif.**

**Filed Jul. 24, 1979, Ser. No. 60,128**
**Int. Cl.³ F01B *25/16*; G02B *5/16***
**U.S. Cl. 415—118** **23 Claims**

**1**. In the method of locating in situ a damaged vane in a front stage of stator vanes of a jet engine, the engine also containing a stage of rotor blades and a rear stage of stator vanes, the rotor blade stage located between the front and rear stator vane stages, the engine including a housing about said stages, the method employing a first radiation passing cable having a probe end, said method including:
(a) inserting the probe end of the cable through the housing and between vanes in said rear stage,
(b) extending said probe end of the cable beyond said rear stage and toward blades of said rotor blade stage,
(c) providing a hook on a second cable protruding from the

probe end of the first cable and hooking said hook to one of the rotor blades by manipulation of the second cable while blocking rotation of the second cable relative to the first cable, so as to block rotation of the first cable relative to said one blade,

(d) rotating said rotor to carry said probe end of the cable relatively past successive vanes in said front stage while



maintaining said probe end directed toward the locus of said vanes in said rear stage so that said front stage vanes are successively brought into the field of view of said probe end, and

(e) remotely viewing said successive vanes of the front stage via transmission of an image of the vanes through the first cable.

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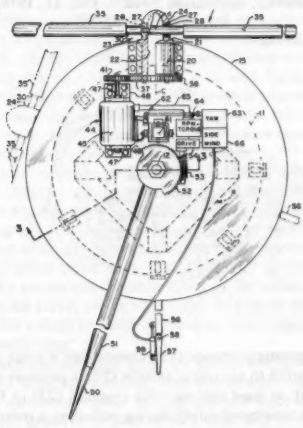
**4,298,313**

## HORIZONTAL AXIS WIND GENERATOR HAVING ADAPTIVE CYCLIC PITCH CONTROL

**Kurt H. Hohenemser, 2421 Remington La., Brentwood, Mo.**

**Filed Jun. 18, 1979, Ser. No. 49,348**
**Int. Cl.³ F03D** *7/02*
**U.S. Cl. 416—98** **18 Claims**



1. A wind energy conversion machine comprising

mast structure,

means for permitting yawing motions at the upper end thereof about a vertical axis, and

wind-responsive components supported on said yaw-permitting means, said components comprising

hub bearing means to establish substantially horizontal rotor axis, and

a rotor having a hub so mounted rotatably in said bearing means as to project the rotor to one side of said mast structure,

the hub having means coupling its rotation to power extracting means, and further having, outwardly of said bearing means,

a transverse shaft having angular oscillation-permitting means supporting it relative to the hub and projecting at each side of the hub, and

a pair of rotor blades mounted on the projecting ends of said transverse shaft,

whereby as the rotor rotates about its said horizontal axis, cyclic pitch variation of the shaft to increase the angle at which one blade meets the relative wind is accompanied by a corresponding decrease of the pitch angle of the other blade, together with

means independent of the mast structure to so yaw the said supported components as to effect an angular offset of said rotor axis relative to the wind direction, which offset increases with wind speed.

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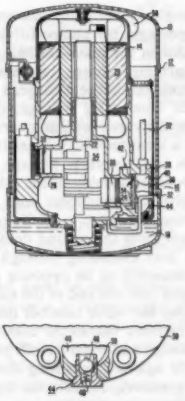
**4,298,314**

## HERMETIC COMPRESSOR HAVING A VALVE TO DRAIN LIQUID ACCUMULATIONS FROM ITS CYLINDER HEAD

**Paul G. Thayer, Staunton, Va., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Jan. 10, 1980, Ser. No. 110,977**
**Int. Cl.³ F04B** *35/04, 49/02*
**U.S. Cl. 417—299** **3 Claims**



1. A hermetic refrigerant compressor comprising:

a hermetic shell having a motor compartment in its upper portion and a crankcase compartment with an oil sump in its lower portion;

a motor in said motor compartment driving a vertically disposed crankshaft which extends down into said lower portion;

a plurality of cylinders arranged radially around the lower portion of said crankshaft and driven thereby, each cylinder having suction valve means and discharge valve means;

a cylinder head for each cylinder, said head defining a discharge pressure space radially outwardly of said discharge valve means and in communication with the compression space of its cylinder only through said discharge valve means; and

drain valve means in the bottom portion of said cylinder head of at least the lowermost of said cylinders, said drain valve means having open and closed positions in response to pressures in said discharge pressure space below and above, respectively, a predetermined pressure, to drain

liquid accumulations from said discharge pressure space to said oil sump during period of non-operation of said compressor.

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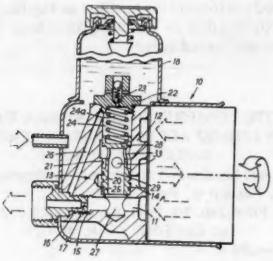
**4,298,315**

## POSITIVE DISPLACEMENT PUMP SYSTEMS

**Ian T. Bristow, Higham, and Nigel J. Petts, Rochester, both of England, assignors to Hobourn-Eaton Limited, Rochester, England**

**Filed Dec. 10, 1979, Ser. No. 101,789**
**Claims priority, application United Kingdom, Dec. 13, 1978, 48270/78**
**Int. Cl.³ F04B *49/00***
**U.S. Cl. 417—300** **2 Claims**



1. A positive displacement pump system providing first and second delivery passages for pumped fluid, a main discharge passage, a restrictor in the main discharge passage, a permanently open connecting passage between the first delivery passage and the main discharge passage, a valve bore opening at one end to the connecting passage, the second delivery passage opening to the valve bore, an overspill port opening to the valve bore at a location which is axially between said one end and said second delivery passage, a valve member mounted in said bore, a chamber at the other end of the valve bore which chamber communicates with the main discharge passage at a location downstream of the restrictor and is permanently closed off from the second delivery passage by the valve member, a duct extending through the valve member and opening permanently at its opposite ends to the second delivery passage and said one end of the valve bore, a spring in said chamber urging the valve member into a stop position in which the valve member blanks off communication between the connecting passage and the overspill port, the valve member being movable against the spring force to uncover the overspill port progressively to place the overspill port in communication with the connecting passage.

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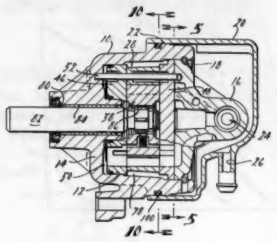
**4,298,316**

## POWER STEERING PUMP

**Guntis V. Strikis, Belleville, Mich., assignor to Ford Motor Company, Dearborn, Mich.**

**Division of Ser. No. 901,915, May 1, 1978, Pat. No. 4,207,038. This application May 18, 1979, Ser. No. 40,246**
**Int. Cl.³ F04B *49/00***
**U.S. Cl. 417—310** **2 Claims**

1. A fluid port comprising a rotor, a cam ring surrounding said rotor, pumping elements carried by said rotor in sliding engagement with said cam ring, said cam ring and said rotor cooperating to define a pumping chamber, an inlet port and an outlet port communicating with said pumping chamber, valve means for controlling the rate of flow of fluid delivered by said pump comprising a valve housing, a high pressure valve port communicating with said outlet port, a valve bypass port communicating with said inlet port, a movable valve spool, a valve chamber slidably receiving said valve spool, said movable valve spool controlling the degree of communication between said high pressure port and said bypass port, a venturi element having a throat portion, an inlet portion and an outlet portion connected by said throat portion, said venturi element inlet portion communicating with said high pressure port and said venturi element outlet portion being connected to a delivery passage, spring means normally biasing said valve spool toward a position that interrupts the communication between said high pressure port and said bypass port, venturi pressure passage means connecting said venturi throat with one side of



said valve spool whereby the venturi throat pressure reduction supplements the force of said spring acting on said valve spool, and a supplemental valve port in said valve chamber located near said bypass port and adapted to be uncovered by said valve spool to establish communication between said venturi pressure passage and said bypass port when the speed of said pump exceeds a predesigned value whereby the rate of increase of pump delivery upon a given increase in pump speed is lower at high speeds than it is at lower speeds.

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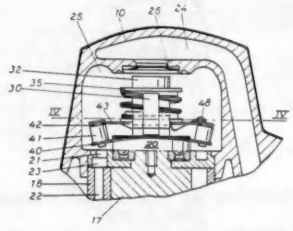
**4,298,317**

## OVERSPEED SAFETY DEVICE

**Gunnar C. Hansson, Stockholm, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden**

**Filed Oct. 9, 1979, Ser. No. 82,575**
**Claims priority, application Sweden, Oct. 11, 1978, 7810607**
**Int. Cl.³ F01B *25/02***
**U.S. Cl. 418—43** **10 Claims**



1. In a pneumatic motor (**11**), comprising a rotor (**17**) drivingly connected to an output spindle (**12**); a pressure air supply passage (**24**); at least one air inlet opening (**23**) to the motor (**11**); and an overspeed safety device including a rotating annular valve disk (**40**) which is elastically deformable and disposed within the pressure air supply passage for axial displacement between an open position and a closed position in which closed position it at least partly covers said at least one air inlet opening (**23**);

the improvement wherein said overspeed device further comprises:

releasable latch means (**41,42,43**) coupled to said valve disk (**40**) to retain said valve disk (**40**) in the open position at motor speeds below a predetermined speed;

said latch means (**41,42,43**) comprising at least two holding

dogs (41) attached to said valve disk (40) and a suspender means (43) rigidly attached to the rotor (17) of said motor (11), said holding dogs (41) being at normal motor speed urged into latching engagement with said suspender means (43) by a spring force obtained by elastic preforming of said elastically deformable valve disk (40), and said holding dogs (41) being responsive to centrifugal action at motor speeds exceeding said predetermined speed to elastically deform said valve disk (40) to release said latching engagement of said holding dogs (41) with said suspender means (43) to thereby permit said valve disk (40) to move towards its said closed position.

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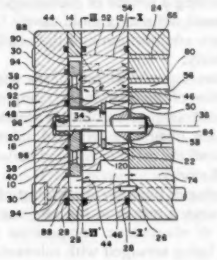
**4,298,318**

## ROTARY VALVE FOR FLUID MOTOR OR PUMP

**Shunji Tsuchiya, Fujisawa, and Takashi Takamatsu, Kamakura, both of Japan, assignors to Tokyo Keiki Company Limited, Tokyo, Japan**

**Continuation of Ser. No. 915,211, Jun. 13, 1978, abandoned.**
**This application Nov. 27, 1979, Ser. No. 97,938**
**Claims priority, application Japan, Mar. 29, 1978, 53-40551**
**Int. Cl.³ F01C *21/12***
**U.S. Cl. 418—61 B** **7 Claims**



1. A rotary valve construction coupled to a drive shaft of a fluid motor or pump for selectively controlling fluid flow to a plurality of cavities defined by a stator having internal teeth and a rotor coupled to the drive shaft and having one less external tooth than the number of the teeth of said stator and in mesh with said stator eccentrically for orbital travel about an axis of rotation, said rotary valve construction comprising:

a pin coaxially coupled to the drive shaft;

an eccentric circular cam including a driving eccentric shaft and a driven eccentric shaft having a phase difference of 90° with said driving eccentric shaft, said driven shaft having an axis aligned with the axis of said stator, said driving shaft having an elongated hole receiving said pin in a position offset from the axis of said driven eccentric cam by an amount corresponding to the radius of the path of orbital travel of the rotor with respect to said stator so that the orbital rotation of the rotor is transmitted to said eccentric cam;

a commutator movably fitted on the driven eccentric shaft of said eccentric circular cam for orbital rotation therewith, said commutator having opposite sides and a pair of annular grooves formed in said sides and in communication with each other;

a spacer rotatably accommodating said commutator and determining a clearance on each side of said commutator, said commutator being rotatable within said spacer and defining a peripheral cavity therewith;

a port member having a plurality of passages selectively connecting (a) said cavities defined by the teeth of said stator and said rotor and selectively expanded and contracted in response to orbital rotation of said commutator and (b) the annular grooves of said commutator or (c) said peripheral cavity, said port member further having a pair of fluid passages respectively providing permanent communication between said annular grooves of said commutator and said peripheral cavity with the ambient atmosphere through said spacer;

an end cover axially secured to said stator; said port member and said spacer being axially secured, in this axial order, between said stator and said end cover, said end cover rotatably supporting said eccentric circular cam; and

seal means between said end cover and said commutator at locations between the annular groove on the commutator and said peripheral cavity and between the annular groove on the commutator and the eccentric cam.

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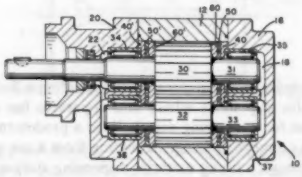
**4,298,319**

## HYDRAULIC GEAR PUMP OR MOTOR WITH FLOATING WEAR PLATES, BALANCE ASSEMBLY, AND UNITARY LOAD BEARING AND ALIGNMENT MEANS

**James L. Glidden, Kalamazoo, Mich., assignor to General Signal Corporation, Stamford, Conn.**

**Filed Oct. 29, 1979, Ser. No. 88,968**
**Int. Cl.³ F03C *2/08*; F04C *2/18, 15/00***
**U.S. Cl. 418—132** **3 Claims**



1. A fluid gear pump or motor apparatus comprising:

(a) a housing having an inlet and an outlet;

(b) an end cover and an adapter cover jointed to opposite ends of said housing;

(c) a pair of meshed gears in said housing, each gear being rotatably mounted on a corresponding gear shaft that extends into said end cover and into said adapter cover;

(d) bearings mounted in said end and adapter covers for rotatably supporting said gear shafts; and

(e) a pair of floating wear plates, each wear plate having a pair of openings through which the gear shafts pass, said openings having a degree of tolerance to allow movement of the wear plate transverse to said gear shaft, and relief recesses in the periphery of said plates,

(f) a pair of balance assemblies, each one operatively associated with a wear plate and adjacent the surface of the wear plate opposite the wearing surface, each balance assembly including a seal member for sealing off the inlet from the outlet and developing an axial fluid force directed towards the wear plate for urging the wearing surface of the wearplate against the gears in order to maintain the volumetric efficiency of the apparatus, and

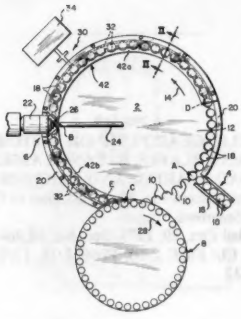
(g) substantially rigid and substantially unmoveable unitary load bearing and alignment means disposed inside said housing, spaced from said gears and between the respective bearings and balance assemblies and contacting said housing, bearings and respective end or adapter cover for maintaining said gears in a predetermined alignment with one another and for transmitting transverse loads on said end cover and housing to said adapter cover, whereby the transverse loads on said pump or motor are maintained in a state of equilibrium.

4,298,320

## APPARATUS FOR DISPENSING AND MOLDING LINING MATERIAL INTO METALLIC CAP SHELLS

Hidehiko Ohmi, Hiratsuka, and Kazuhisa Ishibashi, Tokyo, both of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed May 28, 1980, Ser. No. 153,955
Claims priority, application Japan, Jun. 6, 1979, 54-69929
Int. Cl.[3] B29D *31/00;* B29C *13/02*
U.S. Cl. 425—110 3 Claims



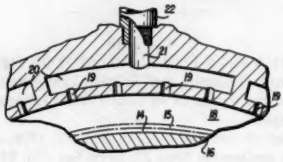
1. An apparatus for dispensing and molding a lining material into metallic cap shells where said apparatus has a conveyor mechanism for conveying cap shells at a predetermined speed through a conveyor passage extending from a cap shell supply station through a lining material dispensing station and onto a cap shell transfer station, a supply mechanism for supplying cap shells to said conveyor mechanism at the shell supply station, a lining material dispensing mechanism for dispensing a predetermined amount of lining material into the cap shells at the lining material dispensing station, and a molding mechanism for receiving the cap shells from said conveyor mechanism at the cap shell transfer station and for molding the lining material in the cap shells into a predetermined shape; the improvement comprising in having a high frequency induction heater for heating cap shells conveyed between said shell supply station and said lining material dispensing station and conveyed between said lining material dispensing station and said shell transfer station, said high frequency induction heater comprising a heating coil extending along the conveyor passage between said shell supply station and said lining material dispensing station and between said lining material dispensing station and said shell transfer station with the coil facing toward the top panels of the cap shells being conveyed through said conveyor passage, in that said coil is positioned further from said conveyor passage at said lining material dispensing station than from said conveyor passage extending between said shell supply station and said liner material dispensing station and from said conveyor passage extending between said liner material dispensing station and said shell transfer station, in having a high frequency oscillator for supplying a high frequency current to said heating coil, in having a guide plate extending along said conveyor passage between said shell supply station and said lining material dispensing station and between said lining material dispensing station and said shell transfer station and extending over and towards skirt edges of cap shells being conveyed through said conveyor passage and in that there is a gap in said guide plate at said liner material dispensing station.

4,298,321

## EQUIPMENT FOR THE INJECTION MOLDING OF MOTOR VEHICLE TIRE TREADS

Achille Gallizia, Milan, Italy, assignor to Societa' Pneumatici Pirelli, Milan, Italy

Division of Ser. No. 860,304, Dec. 14, 1977, Pat. No. 4,166,832.
This application Apr. 25, 1979, Ser. No. 33,166
Claims priority, application Italy, Dec. 30, 1976, 30985 A/76
Int. Cl.[3] B29D *3/02;* B29H *3/08*
U.S. Cl. 425—120 8 Claims



1. An apparatus for injection molding an elastomeric composition to form a tread on a body of a pneumatic tire comprising

means providing a source of elastomeric composition,

molding means defining a mold cavity for shaping the said elastomeric composition into the configuration of a tread on said body,

means connecting said source means with said mold cavity for injection of the elastomeric composition into the mold cavity, said connecting means defining a plurality of equalization chambers arranged substantially symmetrically around the mold cavity and between the said source and mold cavity,

means defining a plurality of feeding channels connecting the said source means to the said equalization chambers for flow of elastomeric composition therebetween, said channels being arranged with substantially the same symmetry as the equalization chambers, and

means defining a plurality of injection passages connecting said equalization chambers to said mold cavity disposed symmetrically with the equalization chambers for injection of said elastomeric composition into the mold cavity, the number of said injection passages supplied with elastomeric composition per feeding channel and the ratio between the cross-sectional area of the feeding channels and the cross-sectional area of the injection passages being selected whereby the ratio between the gradient $\gamma$ of the injection passages and the gradient $\gamma$ of the relative feeding channel is not lower than 8.

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4,298,322

## VENTING MEANS FOR SCREW EXTRUDERS

Dietmar Anders, Hanover, and Manfred Dienst, Burgdorf, both of Fed. Rep. of Germany, assignors to Hermann Berstorff Meschinenbau GmbH, Hanover, Fed. Rep. of Germany

Filed May 23, 1980, Ser. No. 152,692
Claims priority, application Fed. Rep. of Germany, Jun. 2, 1979, 2922572
Int. Cl.[3] B29F *3/03*
U.S. Cl. 425—147 5 Claims

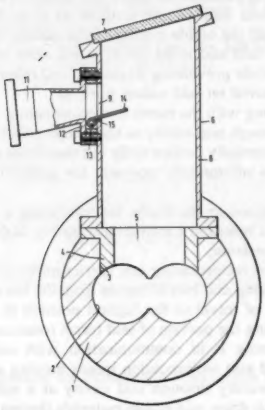
1. A venting assembly adapted for use with a screw extruder of the type having a cylinder, a feed hopper, a screw within said cylinder, and an extrusion orifice, said venting assembly comprising:

(a) a venting aperture formed in said cylinder intermediate said feed hopper and said extrusion orifice;

(b) a venting shaft extending radially outwardly from said venting aperture and being operatively connected to said cylinder so that the radially inner end of said shaft communicates with said venting aperture, said venting shaft being formed with a discharge orifice spaced from said venting aperture;

(c) a pipe operatively connected to said shaft around said discharge orifice, said pipe communicating with a source of low pressure;

(d) a covering flap adjacent said discharge orifice and adapted to close the same, and means for pivotally mounting said flap, the configuration and mounting of said flap



being such that said flap normally projects through said discharge orifice into said venting shaft, said flap, consequent to a rise of material in said shaft sufficient to contact the underside of said flap, pivoting to cut off communication between said discharge orifice and said pipe thereby precluding material from entering said pipe.

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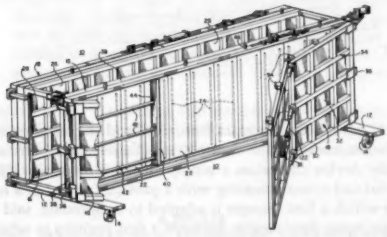
**4,298,323**

## APPARATUS FOR MOLDING LAMINATED FOAM-BODY PANELS

**Leo A. Haydt, Jr., Mountaintop, Pa., assignor to Precision Tool & Machine, Inc., Mountaintop, Pa.**

**Filed Mar. 3, 1980, Ser. No. 126,784**
**Int. Cl.³ B29D *27/04*; B32B *5/20, 31/06***
**U.S. Cl. 425—162** **15 Claims**



1. An apparatus for molding laminated, foam-body panels comprising:

first and second walls, said first wall including means for heating said foam during molding and said second wall comprising access doors;

a first set of at least two adjustable holding and shaping means adapted to engage and form at least two edges of said panels, and disposed angularly adjacent to each other;

a second set of holding and shaping means adapted to engage and form all remaining edges of said panels and disposed angularly adjacent to each other, said first and second walls and said first and second sets of holding and shaping means defining a molding cavity therebetween;

means for simultaneously positioning said first set of adjustable holding and shaping means;

first movable locking means for said first set of holding and shaping means;

second movable locking means for holding said access doors closed flat;

means for actuating and disengaging said first and second locking means, said first locking means being automatically actuated in response to said positioning means; and,

means for filling said cavity with unmolded foam material.

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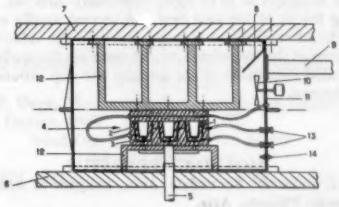
**4,298,324**

## APPARATUS FOR MOLDING PARTICULATE EXPANDABLE THERMOPLASTIC RESIN MATERIAL USING MICROWAVE HEATING

**Joël Soulier, Ivry La Bataille, France, assignor to Isobox-Barbier, Bannalec, France**

**Continuation of Ser. No. 842,314, Oct. 14, 1977, abandoned.**
**This application Sep. 21, 1979, Ser. No. 77,783**
**Claims priority, application France, Sep. 9, 1977, 77 27302**
**Int. Cl.³ B29D *27/00***
**U.S. Cl. 425—174.8 E** **18 Claims**



1. A device for molding particulate expansible plastic dielectric material by microwave radiation, which comprises:

a mold body, in combination with a press and a resonant cavity having wall members wherein the mold body includes a first portion comprising wall surfaces which define the mold cavity and which contact said plastic material to be molded said portion being formed of a resin containing microwave radiation-conducting carbon black which has high dielectric losses and which is microwave-absorbent and wherein the remaining portion of the mold body is made of a material which is essentially transparent to or transmissive of microwave radiation; and

means for applying microwave radiation to said mold body.

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**4,298,325**

## DIE FOR THE EXTRUSION OF MATERIAL IN TUBE FORM

**Robert J. Cole, 224 St. George St., Apt. 501, Toronto, Ontario, Canada (M5R 2N9)**

**Filed Mar. 24, 1980, Ser. No. 133,386**
**Int. Cl.³ B29F *3/04***
**U.S. Cl. 425—192 R** **7 Claims**

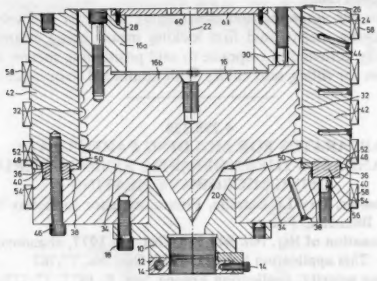
1. A die for the extrusion of material in tube form comprising:

a first cylindrical die member having a respective first longitudinal axis, having a lip portion thereof providing an inner circular die lip of an annular die orifice concentric with the said axis and having a first axially-extending cylindrical surface concentric with the said axis;

a second cylindrical die member having a respective second longitudinal axis coaxial with the first longitudinal axis, having a lip portion thereof providing an outer circular die lip of the said annular die orifice, and having a second axially-extending cylindrical surface concentric with the said axis, the said first and second axially-extending cylindrical

surfaces being of different diameter and facing in opposite radial directions; and

an annular member of a material of a higher coefficient of expansion than that of the first and second cylindrical members, interposed between and engaged with the said first and second axially-extending cylindrical surfaces, so that upon increase in temperature thereof it expands radially to a



greater extent than the material of the first and second cylindrical members so as to apply oppositely-directed, radially-acting forces to the said first and second axially-extending cylindrical surfaces to thereby maintain the relative radial positions of the two members and maintain the uniformity of the radial dimension of the annular die gap around its circumference.

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**4,298,326**

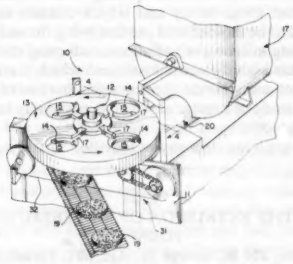
## MOLDING APPARATUS

**Gerald J. Orlowski, Scottsdale, Ariz., assignor to Armour and Company, Phoenix, Ariz.**

**Continuation of Ser. No. 863,713, Dec. 23, 1977, abandoned, which is a division of Ser. No. 705,160, Jul. 14, 1976, Pat. No. 4,065,241. This application Oct. 4, 1979, Ser. No. 81,829**

**Int. Cl.³ A22C** *7/00*

**U.S. Cl. 425—219** **2 Claims**



1. In an apparatus for forming a plurality of uniformly-shaped patties from a mass of agglomerable edible material; said apparatus including:

a frame;

a drive means retained on said frame;

a hopper attached to said frame for receiving a mass of said edible material;

a turret rotatably mounted to said frame and drivingly connected to said drive means including a plurality of cavities located in spaced angular and radial relation therearound, each cavity having a barrier means mounted for reciprocal movement axially therein, each said barrier means having a bottom surface coacting with a cavity to form a mold;

an improvement including housing means having means therein positioned between said hopper and turret for moving said edible material through said hopper and substantially upwardly into said mold, filling it, and forming a patty therein as each mold opening is positioned in substantially complete communication with an enlarged opening on said housing means during an arcuate portion of each turret rotation;

said enlarged opening in said housing including a shallow dished portion which extends from a central portion of said opening substantially along said arcuate path of travel and becomes increasingly shallow as it so extends for directing all the edible material from said housing means upwardly into said mold cavity when same is fed therethrough while preventing stagnation and retention of said edible material on said dished portion;

means coacting with the turret for reciprocating said barrier means through said cavity as said turret rotates to push a patty substantially downwardly out therefrom at a portion of rotation substantially opposite the patty-forming portion; and

means connected to the frame for separating a patty from said barrier means in a manner preventing its deformation during separation;

said means for reciprocating said barrier means through said cavity moving said barrier means from the lowest position in its path of travel to the highest position in its path of travel during the portion of said turret rotation when said mold opening is in communication with said housing means, and said reciprocation means moving said barrier means upwardly through said cavity at a rate of speed sufficient to draw said edible materials therein.

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**4,298,327**

## DEVICE FOR THE MANUFACTURE OF ROD-SHAPED OBJECTS OF DOUGH-LIKE, PARTICULARLY EDIBLE, MATERIAL

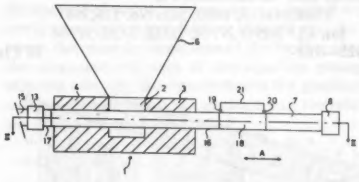
**Wilhelmus F. A. Koppens, Bakel, Netherlands, assignor to Koppens Machinefabriek B.V., Bakel, Netherlands**

**Filed May 19, 1980, Ser. No. 150,723**

**Claims priority, application Netherlands, May 23, 1979, 7904048**

**Int. Cl.³ A21C** *11/00*

**U.S. Cl. 425—344** **7 Claims**



1. A device for the manufacture of rod-shaped objects of dough-like material, for example, croquettes, characterized in that the device comprises a supply chamber for receiving the material and communicating with a passage located in a housing in which a first plunger is adapted to reciprocate, said first plunger being displaceable between a first position in which it completely fills the passage and a second position in which it is located outside the passage and the supply chamber, whilst a second plunger is also adapted to reciprocate in line with the first plunger and is displaceable between a first position in which the end of the second plunger facing the first plunger is located in the supply chamber and a second position in which said end of the second plunger has passed through said passage and is also located outside the supply chamber, and a drive member fixed to said first plunger for moving it from its first to its second position, the drive member including means for moving the second plunger in the same direction as the first plunger after a given time delay, the second plunger being responsive to the displacement of the first plunger from its

second to its first position for moving the second plunger from its second to its first position.

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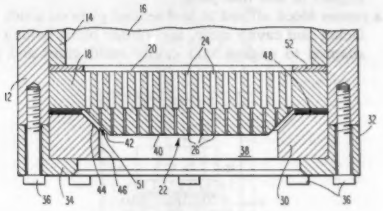
**4,298,328**

## EXTRUSION APPARATUS FOR PREVENTING THE DISTORTION OF PERIPHERAL CELLS IN EXTRUDED HONEYCOMB STRUCTURES

**Rodney I. Frost, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.**

**Filed May 12, 1980, Ser. No. 148,823**
**Int. Cl.³ B29F *3/04***
**U.S. Cl. 425—376 A** **8 Claims**



**1.** An apparatus for extruding a honeycomb structure comprising:

a die body having an inlet surface, an outlet surface, a plurality of feed passageways opening to said inlet surface, and a plurality of discharge slots communicating with said feed passageways and opening to said outlet surface, the extrusion direction being from said inlet surface to said outlet surface along the longitudinal axes of said passageways and slots, said outlet surface being beveled to have

a central primary face substantially perpendicular to the extrusion direction, and

a surrounding face continuously converging in said extrusion direction to said primary face, and an imaginary extension of said surrounding face further continuously converging in said extrusion direction forming an acute angle between said extension of the surrounding face and said primary face;

an extrusion mask having a central orifice for receiving said extruded structure, said orifice being defined by

an exit face substantially parallel to the extrusion direction, and

an imperforate entrance face converging in said extrusion direction to meet the exit face, and an imaginary extension of said entrance face further converging in said extrusion direction forming said acute angle between said extension of the entrance face and said primary face; and

spacing means for mating said entrance face with said surrounding face in parallel spaced apart relation to form a gap of uniform width therebetween and opening about the periphery of said orifice.

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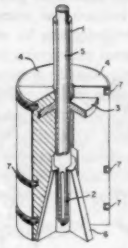
**4,298,329**

## SIZING MANDREL FOR THERMOPLASTIC NETTING

**Charles T. Keller, Tonawanda, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed May 27, 1980, Ser. No. 153,206**
**Int. Cl.³ A01J *21/02***
**U.S. Cl. 425—382 N** **3 Claims**

**1.** A mandrel for sizing extruded cylinders of thermoplastic netting flowing downstream to the mandrel from an upstream extrusion die, the mandrel comprising a hollow tube of substantially circular cross-section having at least one longitudinal aperture formed therein and a transverse guide means attached thereto at a position upstream from the longitudinal aperture, a rod slidably positioned within the tube, the rod having a conical element rigidly connected thereto exterior to the tube and through the longitudinal aperture in the tube, the apex of the conical element being in the upstream position, the mandrel further comprising an exterior cylindrical forming element of at least two radial sections positioned



around and slidably engaged with the guide means and the conical element, the radial sections being retained by at least two circumferential expandable bands.

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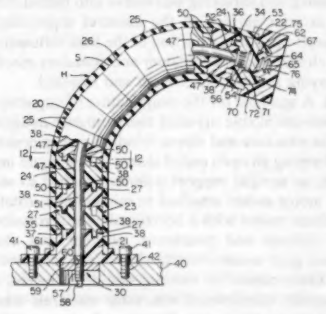
**4,298,330**

## CURVED MANDREL FOR CURING POLYMERIC HOSE AND METHOD

**Richard F. Davis, Waynesville, N.C., assignor to Dayco Corporation, Dayton, Ohio**

**Filed Oct. 22, 1979, Ser. No. 86,984**
**Int. Cl.³ B29H *5/18***
**U.S. Cl. 425—392** **15 Claims**



**1.** A mandrel for supporting an uncured polymeric hose during curing to define a curved configuration in the resulting cured hose comprising:

(a) a plurality of cylindrical members disposed in end-to-end relation, each of said members having opposed end faces, said members comprising a first type having end faces disposed in parallel relation and a second type having end faces disposed in non-parallel relation;

(b) means interlocking said members;

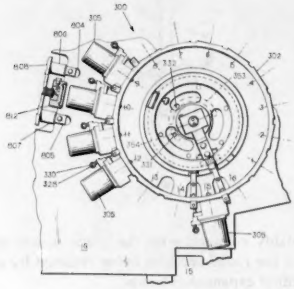
(c) readily attachable and detachable holding means for holding said members axially against each other;

said members with said interlocking means and said holding means being adapted to provide a substantially straight position of said mandrel for easy installation of an uncured straight hose therearound; to provide a predetermined curved configuration position of said mandrel for curing said hose and to provide looseness and axial spacing between said members to enable easy withdrawal of the resulting cured curved hose from around said members.

## 4,298,331
## CONTAINER FABRICATING MACHINE

Martin Mueller, Wonderlake, Ill., assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Nov. 9, 1979, Ser. No. 92,892
Int. Cl.[3] B29C *27/00*
U.S. Cl. 425—393 25 Claims



1. An apparatus for the manufacture of a container of heat-shrinkable thermoplastic material comprising sleeve winding means for forming an open ended sleeve with a liquid impervious side seam, drum means, mounted for rotation about a horizontal axis, positioned adjacent to said sleeve winding means and supporting a plurality of container mandrels each in radial alignment with said drum means, sleeve transfer means for transporting said sleeve from the sleeve winding means to one of the mandrels on said drum means, an array of heat dispensing means positioned adjacent said drum means for heat softening and shrinking said sleeve into partial conformity with the exterior surface of the mandrel supporting said sleeve, means for pressing a portion of the heat softened sleeve into an end closure for said container and container ejection means for removing said container from said mandrel.

11. A machine for the manufacture of cup-shaped containers of heat-shrinkable oriented thermoplastic material comprising a base structure and sleeve winding means positioned thereon for forming an open ended sleeve with a liquid impervious side seam, an upright support column attached to said base structure motor means attached to said column, rotatable cylindrical drum means with a horizontal axis of rotation mounted to said column and positioned adjacent said sleeve winding means, gear means connected between said motor means and said drum means for rotating said drum means, a plurality of outwardly cantilevered container mandrels attached to said drum means, sleeve transfer means for transporting said sleeve from the sleeve winding means to said container mandrels, heat dispensing means positioned adjacent said drum means for heat softening and shrinking said sleeve into partial conformity with the container mandrel supporting said sleeve, means for forming a portion of the heat softened sleeve into an end closure for said container and container removal means for removing said container from said mandrel.

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## 4,298,332
## NOZZLE DEVICE FOR MOLDING PLASTICS

Katashi Aoki, 6037 Ohaza-Minamijo, Sakaki-machi, Hanishina-gun, Nagano-ken, Japan

Division of Ser. No. 27,021, Apr. 4, 1979. This application Jan. 22, 1980, Ser. No. 114,228
Claims priority, application Japan, Apr. 8, 1978, 53-46344
Int. Cl.[3] B29F *1/03*
U.S. Cl. 425—570 4 Claims

1. A mold clamping mechanism comprising:

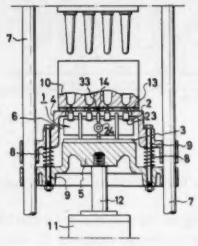
a fixed plate extending in a transverse direction and having a core mold secured thereto, said fixed plate being adapted to receive mold clamping pressure;

a transversely extending first plate slidable in a longitudinal direction with respect to said fixed plate;

a cavity mold secured to said first plate on a side thereof facing said fixed plate and being slidable therewith, said cavity mold being adapted to mate with said core mold and having cavity mold gates opening on a side of said first plate facing away from said fixed plate;

a transversely extending second plate associated with said first plate on a side of said first plate facing away from said fixed plate, said second plate being slidable in said longitudinal direction with respect to said fixed plate and with respect to said first plate;

a runner block affixed to said second plate on a side thereof facing said cavity mold, said runner block having nozzles adapted to engage said cavity mold gates and a sprue



extending from a side of said runner block in a direction generally nonparallel to said longitudinal direction, said sprue being adapted to accept an injection cylinder moving generally in said nonparallel direction;

means for limiting the separation of said second plate from said first plate in said longitudinal direction to a predetermined distance;

plunger means movable in said longitudinal direction for urging said second plate against said first plate to drive said nozzles into associated ones of said cavity mold gates and for driving said cavity mold into a mating relationship with said core mold, and for subsequently retracting said cavity mold from said core mold; and

means for separating said first plate from said second plate said predetermined distance upon retraction of said cavity mold from said core mold to permit withdrawal of said nozzles from said cavity mold gates.

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## 4,298,333
## INDUSTRIAL HEATING INSTALLATION AND METHOD OF OPERATION

Joachim Wunning, Leonberg, Fed. Rep. of Germany, assignor to J. Aichelin, Korntal b. Stuttgart, Fed. Rep. of Germany

Filed Sep. 11, 1978, Ser. No. 941,263
Claims priority, application Fed. Rep. of Germany, Sep. 19, 1977, 2742070
Int. Cl.[3] F23D *11/44*
U.S. Cl. 431—11 15 Claims

1. A heating installation system for heating of industrial ovens or furnaces employing gaseous or liquid fuels comprising:

a fuel line (6, 7);

a burner (5);

means (8, 19) controlling fuel flow to the burner;

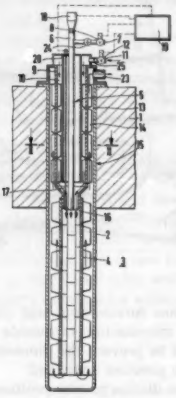
fuel flow resistance control means (24) included in said fuel line (6, 7) and rendering the fuel flow through-put to the burner essentially temperature independent;

an air supply line (11);

means (12, 25) controlling air flow through the air supply line and causing a pressure drop in the air flow therethrough;

the burner (5) being connected to the fuel line and to the air supply line;

and a recuperator (15) having a supply air pressure (10) and being attached to the burner and providing for countercurrent heat exchange of supply air and of exhaust gases, said recuperator supply air passage being dimensioned and arranged to form an air throttle of choke having a pronounced frictional gas flow resistance opposing the flow



of supply air therethrough resulting in a pressure differential between the ends of the recuperator which is a substantial portion of the total pressure drop of supply air through said air flow control means and said recuperator to the burner, said pressure differential increasing with temperature and thereby concurrently causing a decrease in the air supply to the burner and thus self-regulating the air-fuel ratio.

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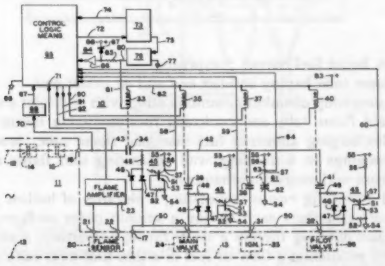
**4,298,334**

## DYNAMICALLY CHECKED SAFETY LOAD SWITCHING CIRCUIT

**Rodney L. Clark, Burnsville; Kenneth B. Kidder, Coon Rapids, and Gary A. Peterson, New Brighton, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.**

**Filed Nov. 26, 1979, Ser. No. 97,471**
**Int. Cl.³ F23Q *23/00***
**U.S. Cl. 431—24** **10 Claims**



1. A condition control system adapted to be connected to load means to operate said load means in a safe manner, including: safety relay means controlled by solid state switching means and including contact means with said contact means connected in a series energizing circuit for said load means; load relay means having load contact means connected to energize said load means in response to said condition control system; said load contact means connected intermediate said safety contact means and said load means so that either said safety contact means or said load contact means can deenergize said load means; control logic means connected to control said solid state switching means to in turn control said safety relay means; said control logic means further connected to control said load relay means to operate said load means; and feedback interface means connecting said solid state switching means and said control logic means; said control logic means periodically changing the state of energization of said solid state switching means and said safety relay means; said control logic means verifying the operation of said solid state switch means from said feedback interface means prior to said safety relay means physically operating; said control logic means restoring the original state of energization of said safety relay means before said safety relay means is capable of physically operating upon verifying from said feedback interface means that said solid state switching means had properly operated.

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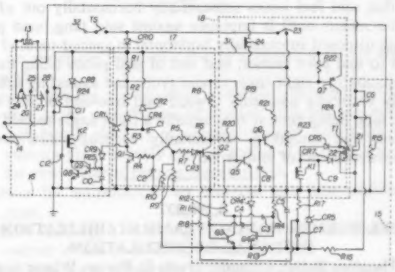
**4,298,335**

## FUEL BURNER CONTROL APPARATUS

**William J. Riordan, Shrewsbury, Mass., and Richard A. Cunha, North Grosvenordale, Conn., assignors to Walter Kidde and Company, Inc., Clifton, N.J.**

**Filed Aug. 27, 1979, Ser. No. 70,164**
**Int. Cl.³ F23N *5/12***
**U.S. Cl. 431—25** **15 Claims**



1. Fuel burner control system comprising:

valve means for controlling the flow of fuel to a burner;

a resistive heater element for igniting fuel emanating from the burner;

power supply means for supplying current to said resistive heater element;

start-up means for opening said valve means to provide fuel to said burner for ignition by said heater element;

electrode means spaced from said heater element in a zone occupied by flame emanating from the burner;

flame sensing circuit means comprising ac source means having a first terminal connected to said electrode means and a second terminal connected to said heater element, and detector means for producing an output signal only in response to the flow between said electrode means and said heater element of current rectified by the flame;

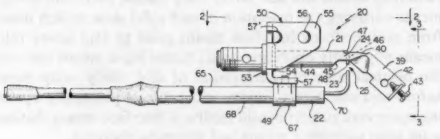
valve control circuit means for maintaining said valve means open in response to said output signal; and

coupling circuit means interconnecting said heating element with said power supply means and said sensing circuit means, said coupling circuit means adapted to prevent the flow of current between said power supply means and said sensing circuit means.

## 4,298,336
## PILOT BURNER IGNITION MEANS AND METHOD OF MAKING THE SAME

**Fred Riehl, Greensburg, Pa., assignor to Robertshaw Controls Company, Richmond, Va.**

**Filed Sep. 10, 1979, Ser. No. 73,673**
**Int. Cl.³ F23Q *3/00***
**U.S. Cl. 431—264** **12 Claims**



1. In a combination of a pilot burner having means for issuing fuel out of an outlet means thereof and being supplied thereto from a source of said fuel and an electrical probe having an end spaced from said outlet means of said pilot burner to provide a spark gap therewith and through which an electrical sparking is adapted to take place to ignite said issuing fuel when said probe is interconnected to a source of electrical energy and said fuel is issuing from said outlet means, the improvement wherein said end of said probe is disposed beneath said outlet means, said pilot burner having a diffusion tang adjacent said outlet means, said end of said probe defining said spark gap with said tang, said tang having a free end disposed in the path of the fuel issuing from said outlet means, said end of said probe defining said spark gap with said free end of said tang, said free end of said tang and said end of said probe being disposed in substantially vertically aligned relation, said pilot burner being disposed substantially horizontal so that said fuel issues substantially horizontally out of said outlet means until it impinges against said tang, said probe being disposed substantially horizontal in spaced parallel relation to said pilot burner, said end of said probe being bent at substantially a right angle to said probe and extending substantially vertically upwardly toward said free end of said tang, said tang being bent at substantially a right angle to said pilot burner and extending substantially vertically downwardly toward said end of said probe.

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## 4,298,337
## FUEL BURNER HAVING FLAME STABILIZATION BY INTERNAL RECIRCULATION

**G. Theodore Butler, Orlando; Travis G. Porter, Winter Garden, and Harold E. Fisher, Altamonte Springs, all of Fla., assignors to Mechtron International Corporation, Orlando, Fla.**

**Filed Apr. 23, 1979, Ser. No. 32,135**
**Int. Cl.³ F23Q *9/00***
**U.S. Cl. 431—285** **6 Claims**

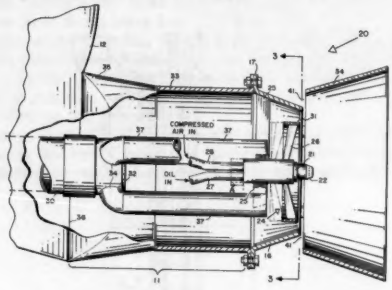
1. A fuel burner having a controlled size combustion volume comprising:

air pressurization means for introducing combustion air under pressure into said combustion volume, said air pressurization means includes a turbo blower and air flow directing means for directing said pressurized air into said combustion volume;

means for introducing atomized liquid fuel into the combustion volume and for mixing with the combustion air to produce a flame;

aerodynamic stabilization means for producing aerodynamic stabilization of the flame within said combustion volume by reducing the velocity of combustion gases within the flame to less than the flame propagation velocity, said aerodynamic stabilization means having air rotation means disposed adjacent to said combustion volume for causing rotation of said pressurized air from said turbo blower arranged to cause said air to enter said combustion volume in a swirling motion having a less-than-atmospheric pressure zone in the central portion thereof to cause internal recirculation of combustion gases in said combustion volume to thereby reduce the velocity of said combustion gases to less than the flame propagation velocity;

size controlling means for introducing additional combustion air into said combustion volume to limit the size thereof, said size controlling means having air aspiration



control means surrounding said combustion volume for controlling introduction of outside air into said combustion volume to prevent the dimunition of such less-than-atmospheric pressure zone; and

at least one gas discharge tube positioned for injecting a gas fuel into said aerodynamic stabilization means whereby a gas fuel can be mixed with combustion air.

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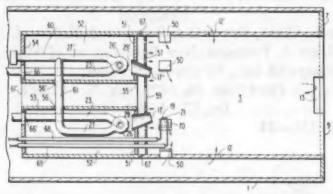
## 4,298,338
## LIQUID FUEL BURNERS

**Robert S. Babington, McLean, Va., assignor to Owens-Illinois, Inc., Toledo, Ohio**

**Filed May 8, 1979, Ser. No. 37,190**
**Int. Cl.³ F23D *15/04***
**U.S. Cl. 431—352** **13 Claims**



1. A liquid fuel burner comprising:

a flame tube having an inlet end and an outlet end,

an atomizing chamber communicating with said inlet end of said flame tube and enclosing fuel atomizing means for discharging atomized fuel into said flame tube through openings in a dividing wall separating said flame tube from said atomizing chamber,

said atomizing means comprising a plurality of hollow plenum chambers each having a smooth outer surface and each defining therein a small through aperture, a means for producing a flow of fuel in a thin film over each said through aperture and a means for introducing air under pressure into each said plenum chamber to rupture said film at said aperture,

means for supporting said plenum chambers in said atomizing chamber in a manner to cause the plurality of directional streams of atomized fuel issuing therefrom to be directed through respective ones of said openings in said dividing wall into said flame tube in directions extending toward and along the central axis of said flame tube for

combustion of substantially all said atomized fuel within said flame tube,

means for introducing air into said atomizing chamber to thereby cause low velocity air to issue through said openings in said dividing wall along with said streams of atomized fuel and said pressurized air issuing from each said plenum chamber,

means for igniting the atomized fuel in said flame tube downstream of its said inlet end,

first means for introducing air into said flame tube adjacent its inlet end with a tangential component to produce in said flame tube a single tangential vortex to promote the admixing of air with the atomized fuel and to maintain the flame spaced from the flame tube's inner surface adjacent its inlet end,

and second means for introducing air into said flame tube at at least one location downstream of the location of air introduction by said first means and downstream of the point of ignition of the fuel-air mixture by said ignition means with a velocity and direction to impede the tangential vortex generated by said first means so as to permit the flame to expand to the flame tube wall and to permit substantially complete combustion within the confines of the flame tube.

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**4,298,339**

## METHOD OF HEAT TREATING A MATERIAL

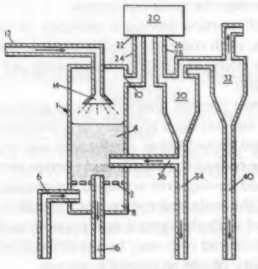
**Arthur A. Randell, Tewkesbury, England, assignor to Coal Industry (Patents) Limited, London, England**

**Filed Oct. 16, 1979, Ser. No. 85,412**

**Claims priority, application United Kingdom, Nov. 14, 1978, 44452/78**

**Int. Cl.³ F27B *15/00***

**U.S. Cl. 432—15** **5 Claims**



**1.** A method for the thermal treatment of a slurry material having combustible and incombustible components, including the steps of spraying the material onto a fluidised bed, burning the combustible components at least in part in the fluidised bed, the water being volatilised, maintaining the fluidised bed at a temperature below that at which the solids components sinter, separating solids material from gases issuing from the fluidised bed, feeding the separated material back into the bed, and reintroducing the separated material at a position located in a central zone of the fluidised bed laterally thereof beneath the incoming spray thereby to suppress at least some material elutriated from the bed.

**4,298,340**

## METHOD AND APPARATUS FOR PRODUCING A HYDRAULIC BINDER

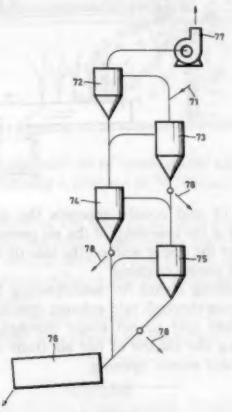
**Horst Herchenbach, Troisdorf, Fed. Rep. of Germany, and Bartl Lechner, Kufstein, Austria, assignors to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany**

**Division of Ser. No. 27,035, Apr. 4, 1979, Pat. No. 4,236,932. This application Apr. 22, 1980, Ser. No. 142,705**

**Claims priority, application Fed. Rep. of Germany, Apr. 7, 1978, 2815161**

**Int. Cl.³ F27B *15/00***

**U.S. Cl. 432—58** **7 Claims**



**1.** An apparatus for production of a hydraulic binder which comprises:

means defining a preheating zone for particulate material used in the manufacture of cement, said preheating zone including a plurality of sequential stages each stage providing a progressively greater degree of deacidification to the raw material passing therethrough,

means for introducing raw material into said preheating zone,

means defining a calcining zone receiving the preheated output of said preheating zone, and

discharge means between said preheating zone and said calcining zone for withdrawing a portion of the preheated material of a predetermined degree of deacidification which is less than complete deacidification.

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**4,298,341**

## INDUSTRIAL OVEN HAVING AIR RECIRCULATING MEANS FOR MINIMIZING HEAT LOSS

**William C. Nowack, Rte. 2, Box 256-2A, Lake Geneva, Wis. 53147**

**Filed Mar. 21, 1980, Ser. No. 132,495**

**Int. Cl.³ F24F *9/00*; F27D *7/00***

**U.S. Cl. 432—64** **17 Claims**

**1.** An industrial oven for heat treating a series of articles, comprising

a tunnel enclosure having a tunnel space therein through which the articles to be heat treated may pass,

said tunnel enclosure having upper and lower walls and side walls,

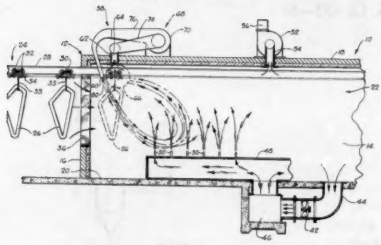
said side walls including a terminal wall having an access opening through which the articles to be heat treated may pass,

conveyor means for carrying the articles through said access opening and said tunnel space,

heating means for supplying heat to said tunnel space to heat treat the articles,

a nozzle disposed within said tunnel enclosure near said upper wall and near said terminal wall for directing a stream of hot air downwardly across the access opening, said nozzle being angled downwardly into said tunnel space and away from said access opening to resist the escape of hot air from said tunnel space through said access opening,

an exhaust structure having an exhaust opening disposed within said tunnel enclosure at the upper wall thereof on



the side of said nozzle opposite the access opening to provide for the lowering of the air pressure in said tunnel space near the upper wall on the side of the nozzle remote from said access opening,

and air handling means for withdrawing hot air from said tunnel space through said exhaust opening while blowing hot air into said tunnel space through said nozzle for minimizing the escape of hot air from said tunnel space through said access opening.

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**4,298,342**

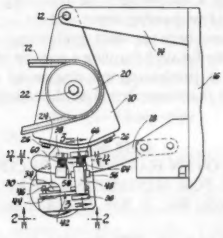
**AUTOMATIC BELT TENSIONER**

**Kenneth H. Clayton, Anderson; Charles D. Denniston, Middletown; Donald G. Guetersloh, Anderson, and Melvin H. Hallmann, Middletown, all of Ind., assignors to General Motors Corporation, Detroit, Mich.**

**Filed Dec. 10, 1979, Ser. No. 101,589**

**Int. Cl.³ F16H 7/12**

**U.S. Cl. 474—110** **2 Claims**



1. A belt tensioner comprising; stationary base means; pulley support means pivotally mounted on said base means; bracket means secured to said base means; pulley means rotatably mounted on said pulley support means; belt means trained on said pulley means; motor means secured to said pulley support means; lever means operatively connected to said motor means and having a pair of pivot axes; and cam means operatively connected to said pulley support means and said bracket means including gripping cam means pivotally and rotatably mounted on said pulley support means and being driven by said motor means through said lever means pivoting on the first of said pair of pivot axes to urge said pulley support means to pivot on said base means and move in one direction relative to said bracket means to increase the tension in said belt means, and locking cam means for engaging said bracket means to prevent relative movement between said pulley support means and said bracket means in the opposite direction while said lever means is pivoted on the second of said pair of pivot axes.

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**4,298,343**

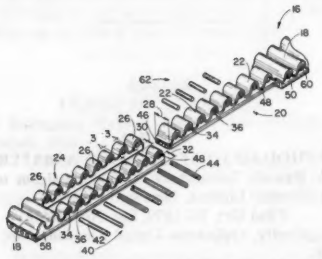
**REINFORCED BELT SPLICE**

**John D. Redmond, Jr., Littleton, Colo., assignor to The Gates Rubber Company, Denver, Colo.**

**Filed Mar. 10, 1980, Ser. No. 128,749**

**Int. Cl.³ F16G 3/02**

**U.S. Cl. 474—255** **7 Claims**



1. In a toothed power transmission belt with an elastomeric body severed to a desired width and having an embedded tensile member, the belt adapted for splicing to endless form and wherein the improvement comprises:

a male-end belt portion having a plurality of substantially parallel rods, each rod embedded in a belt tooth and unadhered to the body, the rods oriented with and severed at the belt width;

a female-end belt portion dimensioned to receive the male-end portion and having a plurality of substantially parallel rods, each rod embedded in a belt tooth and unadhered to the body, the rods of the female-end portion severed at the belt width and having axes arranged for coaxial alignment with axes of the male-end rods when the male-end portion is overlapped with the female-end portion; and

whereby said unadhered rods may be extracted from said ends to define a plurality of pin receiving openings.

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## AGE RESISTANT CHROME TANNING AGENTS

Herbert Knopf; Heinrich Spahrkäs, and Wolfhard Luck, all of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Feb. 15, 1980, Ser. No. 121,863

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1979, 2908967

Int. Cl.³ C14C *3/06*

U.S. Cl. 8—94.26 4 Claims

1. A pulverulent spray dried chrome tanning agent having about 1.8 to 2.6 mols of formate/mol $Cr_2O_3$, a basicity of at least about 42% and a sulphate content of at least about 1.8 mols $SO_3$/mol $Cr_2O_3$.

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4,298,345

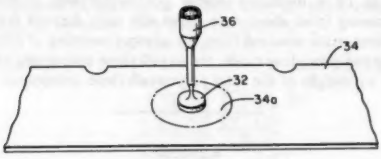
## METHOD AND APPARATUS FOR CHEMICAL SPOT TEST ANALYSIS

Lester A. Sodickson, Newton, Mass., and Franklin Lim, Richmond, Va., assignors to Damon Corporation, Needham Heights, Mass.

Division of Ser. No. 853,435, Nov. 21, 1977, Pat. No. 4,178,153. This application Mar. 30, 1979, Ser. No. 25,497

Int. Cl.³ G01N *1/14, 21/27*

U.S. Cl. 23—230 R 15 Claims




1. A method for preparing a porous medium for use in chemical spot test analysis employing a measured parameter responsive to concentration of a reaction-produced material at a test site on the porous medium, said method including the improvement comprising the step of exposing at least said test site of said medium to a liquid preparation conditioning agent having a balance of hydrophobic and hydrophilic properties for retarding the spreading of liquid in the medium and for increasing the concentration of liquid the medium can hold, said exposure being sufficient, after drying, to diminish the absorption of liquid by the porous structure of said medium.

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4,298,346

## VIRUS HEMAGGLUTINATION-INHIBITION REACTION

Homu Ito, Nagaokakyo, Japan, assignor to Takeda Chemical Industries, Ltd., Osaka, Japan

PCT No. PCT/JP79/00010, § 371 Date Oct. 6, 1979, § 102(e) Date Jan. 29, 1979, PCT Pub. No. WO79/00675, PCT Pub. Date Sep. 20, 1979

PCT Filed Jan. 17, 1979, Ser. No. 85,641

Claims priority, application Japan, Feb. 6, 1978, 53-12655; Oct. 11, 1978, 53-125434

Int. Cl.³ G01N *33/48*

U.S. Cl. 23—230 B 3 Claims

1. In an arbovirus hemagglutination-inhibition test reaction which comprises pretreating a test serum for an arbovirus hemagglutination-inhibitors, mixing the pretreated test serum with an arbovirus-specific hemagglutinating antigen and then adding erythrocytes to assess occurrence of hemagglutination, the improvement which comprises (1) pretreating the test serum with a composition containing both fixed avian erythrocytes and kaolin particles, (2) employing the fixed avian erythrocytes as the erythrocytes to be agglutinated, and (3) diluting, respectively, the pretreated test serum, the arbovirus-specific hemagglutinating antigen and the fixed avian erythrocytes with a single common buffer in the pH range of 6.6 to 12.0.

4,298,347

## $^{13}CO_2$ BREATH TEST

Fraser M. Walsh, Arlington, Mass., assignor to Kor Incorporated, Cambridge, Mass.

Filed Feb. 25, 1980, Ser. No. 124,341

Int. Cl.³ G01N *33/52*

U.S. Cl. 23—230 B 2 Claims

1. A method for the analysis of mass-labeled carbon dioxide in exhaled air containing a mixture of $^{12}CO_2$ and $^{13}CO_2$ comprising:

contacting a sample of the exhaled air with a solution of an organometallic compound that reacts with $CO_2$ to form $^{13}C$ and $^{12}C$ labeled carbonyl compounds having unique and well separated infrared spectral peaks for the $^{12}C$ and $^{13}C$ products and

determining the relative amounts of the $^{13}C$ and $^{12}C$ carbonyl compound by infrared spectroscopy.

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4,298,348

## TIME-TEMPERATURE INDICATOR COMPOSITION

Dawn M. Ivory, Randolph, N.J., assignor to Allied Corporation, Morris Township, Morris County, N.J.

Filed Mar. 3, 1980, Ser. No. 126,515

Int. Cl.³ G01N *21/06*

U.S. Cl. 23—230 R 6 Claims

1. A process for activating a recording device including a substrate having deposited thereon 2,4-hexadiyn-1,6-diol-bis(p-chlorobenzenesulfonate) in an inactive form which comprises heating the device above the melting point of the inactive form and cooling the device to form an active form of 2,4-hexadiyn-1,6-diol-bis(p-chlorobenzenesulfonate).

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4,298,349

## USE OF ALDEHYDES AS EMBRITTLING AGENTS FOR WASTE

Shlomo M. Gabbay, Irvine, Calif., assignor to Occidental Research Corporation, Irvine, Calif.

Filed Aug. 31, 1979, Ser. No. 71,438

Int. Cl.³ C10L *9/02*

U.S. Cl. 44—1 C 25 Claims

1. A method of converting the solid organic fraction of waste into a powdered fuel which comprises heating said solid organic fraction in the presence of an aldehyde having more than one carbon atom for a time and at a temperature sufficient to embrittle said solid organic fraction, comminuting said embrittled solid organic fraction to a powder and recovering said powder.

2. The method of claim 1 wherein said aldehyde is a $C_2$ to $C_5$ aldehyde.

14. A method for separating municipal solid waste (MSW), comprising an inorganic fraction; including glass, ferrous metals and aluminum; and a solid organic fraction, into valuable materials which comprises:

(a) shredding the MSW to provide a comminuted MSW;

(b) separating a ferrous metal fraction from said comminuted MSW and recovering a substantially ferrous metal-free fraction;

(c) separating said substantially ferrous metal-free fraction into an inorganic fraction, which includes glass and aluminum and a solid organic fraction;
(d) comminuting such inorganic fraction to provide an aluminum-rich fraction having a particle size greater than 0.5 inches and a glass rich fraction having a particle size of less than 0.5 inches;
(e) separating such aluminum-rich fraction from said glass-rich fraction;
(f) recovering glass from said glass-rich fraction;
(g) recovering aluminum from said aluminum-rich fraction;
(h) heating said solid organic fraction of step (c) in the presence of an aldehyde having more than one carbon atom for a time and at a temperature sufficient to embrittle such solid organic fraction;
(i) comminuting said embrittled solid organic fraction to a powder; and
(j) recovering said powder.

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**4,298,350**
**METHOD OF EMBRITTLING WASTE**
**Hans F. Bauer, Dana Point, Calif., assignor to Occidental Research Corporation, Irvine, Calif.**
**Filed Sep. 17, 1979, Ser. No. 76,009**
**Int. Cl.³ C10L *9/08***
**U.S. Cl. 44—1 C** **20 Claims**

**1**. A method of converting the solid organic fraction of waste into a powdered fuel which comprises heating said solid organic fraction in an inert atmosphere, in the absence of any added chemical embrittling agent, selected from the group consisting of mineral acids, organic acids and formaldehyde, for a time and at a temperature sufficient to embrittle said solid organic fraction without causing substantial pyrolysis, substantial decomposition or substantial loss in dry weight of said solid organic fraction, comminuting said embrittled solid organic fraction to a powder and recovering said powder.

**3**. The method of claim **1** wherein said inert atmosphere comprises less than 5% by weight oxygen.

**4**. The method of claim **1** wherein the embrittlement takes place at a temperature of at least 125° C.

**11**. A method for separating municipal solid waste (MSW), comprising an inorganic fraction; including glass, ferrous metals and aluminum; and a solid organic fraction, into valuable materials which comprises:
(a) shredding the MSW to provide a comminuted MSW;
(b) separating a ferrous metal fraction from said comminuted MSW and recovering a substantially ferrous metal-free fraction;
(c) separating said substantially ferrous metal-free fraction into an inorganic fraction, which includes glass and aluminum and a solid organic fraction;
(d) comminuting such inorganic fraction to provide an aluminum-rich fraction having a particle size greater than 0.5 inches and a glass rich fraction having a particle size of less than 0.5 inches;
(e) separating such aluminum-rich fraction from said glass-rich fraction;
(f) recovering glass from said glass-rich fraction;
(g) recovering aluminum from said aluminum-rich fraction;
(h) heating said solid organic fraction of step (c) in an inert atmosphere, in the absence of any added chemical embrittling agent, selected from the group consisting of mineral acids, organic acids and formaldehyde, for a time and at a temperature sufficient to embrittle said solid organic fraction without causing substantial decomposition, substantial pyrolysis, or substantial loss in dry weight of said solid organic fraction;
(i) comminuting said embrittled solid organic fraction to a powder; and
(j) recovering said powder.

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**4,298,351**
**METHANOL AUTOMOTIVE FUEL**
**Roland D. Earle, Key Largo, Fla., assignor to Prime Manufacturing Company, Lynn, Mass.**
**Filed May 5, 1980, Ser. No. 146,752**
**Int. Cl.³ C10L *1/18***
**U.S. Cl. 44—53** **24 Claims**

**1**. A fuel for use in an internal combustion engine comprising methanol containing 7–25% of a tertiary alkyl peroxide.

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**4,298,352**
**DIESEL FUEL COMPRISING METHANOL AND A METHANOL-SOLUBLE POLYOXYALKYLENE COMPOUND**
**Ake Blysing, Stenungsund, Sweden, assignor to Berol Kemi AB, Stenungsund, Sweden**
**Division of Ser. No. 855,576, Nov. 29, 1977, abandoned. This application Aug. 4, 1980, Ser. No. 176,939**
**Int. Cl.³ C10L *1/18, 1/22, 1/24, 1/26***
**U.S. Cl. 44—53** **13 Claims**

**1**. A process for operating a diesel engine, which comprises running the engine on a methanol-base diesel fuel consisting essentially of at least 50% by weight methanol and, per 100 parts by weight of methanol, from about 2 to about 40 parts by weight of a methanol-soluble polyoxyalkylene compound containing from about 4 to about 400 units derived from an alkylene oxide selected from the group consisting of ethylene oxide and propylene oxide, the oxyalkylene units being at least 40% by weight of the total polyoxyalkylene compound.

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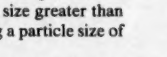
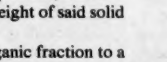
**4,298,353**
**ANTI-STATIC ADDITIVES**
**James R. Spence, Warrenville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.**
**Division of Ser. No. 900,102, Apr. 26, 1978, Pat. No. 4,252,542, which is a continuation-in-part of Ser. No. 810,378, Jun. 27, 1977, abandoned. This application Feb. 25, 1980, Ser. No. 124,096**
**Int. Cl.³ C10L *1/18, 1/22***
**U.S. Cl. 44—71** **11 Claims**

**1**. A composition comprising about 1 to 100 parts by weight of an aminomethylene sulfonic acid composition comprising the reaction product of:
A. an amine selected from the group consisting of an adduct of a polyamine and a hydrocarbyl succinic anhydride and a compound of the formula $R_1—NH—CH_2CH_2CH_2NH_2$ or a compound of the formula $R—NH_2$ wherein R and $R_1$ have 1 to 25 carbon atoms:
B. about 0.5 to 1.5 equivalents of a carbonyl compound having the formula:



wherein $R_2$ comprises a hydrogen or methyl group and $R_3$ comprises a hydrogen or an alkyl group having 1 to 7 carbon atoms, per equivalent of component A and
C. about 0.1 to 2.0 equivalents sulfur dioxide per mole of component A; and about 1 part of the adduct of a maleic anhydride/1-olefin copolymer and an amine-compound of the formula



wherein $X_1$, $X_2$ and $X_3$ are independently a hydrogen or an alkyl group having 1 to 20 carbon atoms.

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## PREPARATION OF ALCOHOLS FROM SYNTHESIS GAS

Harley F. Hardman, Lyndhurst, and Ronald I. Beach, Chagrin Falls, both of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Division of Ser. No. 54,216, Jul. 2, 1979, which is a continuation of Ser. No. 905,703, May 15, 1978, abandoned. This application Jun. 27, 1980, Ser. No. 163,666

Int. Cl.³ C10L *1/02*

U.S. Cl. 44—56 10 Claims

1. An alcohol mixture suitable for mixing with gasoline comprising at least about 40% methanol, the remaining of said composition comprising higher alcohols, the distribution of said higher alcohols on a methanol-free basis being

$C_2$—4–25 weight %

$C_3$—0.1–25 weight %

$C_4$—0.5–70 weight %

$C_5$—0.1–12 weight %, and

$C_6$—0.1–10 weight %.

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4,298,355

## METHOD FOR THE GASIFICATION OF COAL

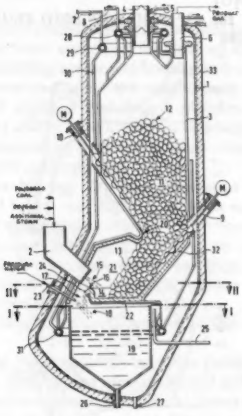
Gernot Staudinger, Graz, Austria, assignor to Voest-Alpine AG, Vienna, Austria

Filed Oct. 1, 1979, Ser. No. 81,083

Claims priority, application Austria, Dec. 29, 1978, 9346/78; Fed. Rep. of Germany, May 23, 1979, 2920922

Int. Cl.³ C10J *3/16*

U.S. Cl. 48—206 11 Claims



1. In a method for the gasification of coal with oxygen or oxygen-containing gas and water vapor and also if required $CO_2$, said method being of the type in which powdered coal is gasified in at least one burner, e.g. a cyclone burner, with oxygen or oxygen-containing gas and steam and also if required added $CO_2$ and the primary gas thereby produced is passed under pressure upwardly, preferably in a countercurrent direction, through coarser coal contained in a shaft gasifier, e.g. a bed of lumps of coal forming free surfaces on the top and bottom thereof, thereby producing product gas and forming liquid slag, the improvement comprising:

collecting said liquid slag formed in said shaft gasifier in a slag bath within the interior of said shaft gasifier;

allowing the thus collected liquid slag to flow off over a weir into a cooling water bath provided in said shaft gasifier;

directing at least one water jet against said liquid slag at a position located below at least one jet of said primary gas as the slag is falling freely within said shaft gasifier between said weir and said cooling water bath, thus atomizing said liquid slag, thereby cooling said slag and generating steam; and

directing said at least one jet of said primary gas toward said coarser coal, to said free bottom surface of said bed thereof, and supplying at least part of said steam generated during the atomization of said slag as process steam to said coarser coal, to said free bottom surface of said bed thereof, by said steam being directly mixed with and carried by said primary gas jet toward said coarser coal.

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4,298,356

## PROCESS FOR THE MANUFACTURE OF ABRASIVES

Eckart Teschner, Hünstetten; Richard Sattelmeyer, Schlangenbad, and Wolfgang Hesse, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 6, 1979, Ser. No. 100,910

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1978, 2853761

Int. Cl.³ B24D *11/00*

U.S. Cl. 51—297 10 Claims

1. In a process for the preparation of an abrasive material having two binder layers comprising the following steps

(i) applying a first binder layer of a flexible sheet-like support;

(ii) scattering abrasive particles onto the said first binder layer;

(iii) drying the product of step (ii) in a horizontal drying unit and subsequently cooling the product in an air stream, the drying process being effected for a time sufficient to allow the said first binder layer to attain sufficient adhesive strength to prevent displacement of the abrasive particles disposed therein when the product is cooled;

(iv) applying a second binder layer as sizer to the cooled product of step (iii);

(v) drying the second binder layer in a horizontal drying unit and subsequently cooling the product, heating and cooling being effected in similar manner to that of step (iii), the drying process being effected for a time sufficient to allow the said second binder layer to become imprint resistant;

(vi) loosely rolling up the product of step (v) and

(vii) curing the product of step (vi);

wherein at least one of the said first and second binder layers comprises at least one aqueous resol I which resol has been prepared from a monohydric phenol and formaldehyde in a molar ratio of phenol:formaldehyde of between 1:1.1 and 1:2.5, the improvement comprising that at least one of said binder layers consists of said resol I and at least one resol condensation product II prepared from 100 to 10 mole% of a polyhydric phenol and 0 bis 90 mole% of a monohydric phenol and formaldehyde wherein the molar ratio of the starting amount of formaldehyde to the total amount of the phenols is (0.6 to 1.5):1, in the absence of polyvinyl alcohol, conveying the coated carrier material at speed of above 5 m/min through the said drying units having well defined indepcndently controllable heating and cooling zones wherein the coated carrier material is contacted with an air stream emitted from slit nozzles arranged transversely to the direction of travel of the coated material, the air stream having a velocity between 5 and 200 m/sec at the nozzles outlets and an outlet temperature between 20° and 300° C. dependent on the temperature zone and drawing of air off with adjacent suction nozzles.

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4,298,357

## DEGASSING SYSTEM

Stanley J. Pernic, Round Lake, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation of Ser. No. 923,324, Jul. 10, 1978, abandoned. This application Jun. 30, 1980, Ser. No. 164,142

Int. Cl.³ B01D *31/00*

U.S. Cl. 55—165 13 Claims

1. A degassing system for use in an artificial kidney system

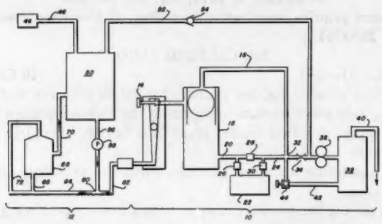
for removing dissolved and entrained gases from a liquid prior to delivery of said liquid to a dialyzer, said degassing system including:

chamber means for receiving the liquid to be degassed and constructed to degas said liquid at negative pressures as low as about −650 mm/Hg, said chamber means including a liquid inlet for receiving liquid to be degassed; a gas outlet through which gas is withdrawn; and a liquid outlet from which degassed liquid is drawn for delivery to a dialyzer;

valve means associated with said liquid inlet means for controlling liquid flow into said chamber means and the liquid level within said chamber means so as to define a restricted volume for gas within said chamber means; and

pump means associated with said liquid outlet for drawing said liquid from said liquid outlet;

wherein the improvement comprises:



(a) said chamber means further including means defining an inlet for receiving recirculating liquid; and

(b) there being further provided a recirculation loop associated with said chamber means whereby at least a portion of the liquid drawn from the chamber through said liquid outlet is recirculated to the chamber through said recirculation inlet means, said loop including variable-restriction assembly means through which said recirculating liquid flows, said assembly means including:

(i) variable restriction means positioned downstream of said pump means for cooperation in enhancing degassing by separating gas from liquid flowing through said assembly; and

(ii) sensing means for sensing the pressure of the liquid flowing to said assembly and for varying said restriction means in relation to said pressure sensed by said sensing means.

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**4,298,358**

## GAS SEPARATING AND VENTING FILTER

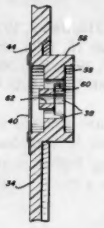
**Ricky R. Ruschke, McHenry, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.**

**Division of Ser. No. 2,689, Jan. 11, 1979, Pat. No. 4,238,207, which is a division of Ser. No. 856,147, Nov. 30, 1977, Pat. No. 4,190,426. This application Jul. 12, 1979, Ser. No. 57,082**

**Int. Cl.³ B01D *46/00***

**U.S. Cl. 55—185** **2 Claims**

1. In a gas separating and venting fluid filter comprising: a housing including inlet opening means and outlet opening means, liquid-wetting filter means disposed in a flow path between said inlet and outlet opening means to permit the passage of liquid only, vent opening means in said housing on the upstream side of said liquid-wetting filter means to vent gas from the housing, and liquid-repellent filter means in the path of venting gas to permit the passage of gas only and to prevent the escape of liquid from said housing, the improvement comprising: automatic vent control means carried by said housing, said vent control means being sensitive to the differential pressure between the interior of said housing and the ambient atmosphere and operable under a positive differential to permit venting of separated gas from the vent opening means to the ambient atmosphere, and being further operable to prevent the admission of gas from the ambient atmosphere into the vent opening means, and said liquid-repellent filter means being generally planar and being mounted on said housing by a



continuous medical grade adhesive tape which overlaps the peripheral edge of said filter means and the portion of said housing adjacent said peripheral edge.

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**4,298,359**

## CENTRIFUGAL SEPARATOR HAVING HEAT TRANSFER MEANS

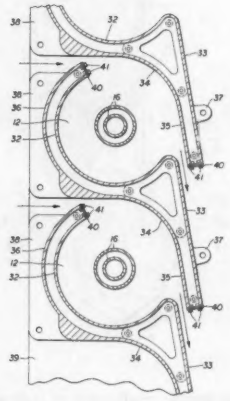
**Egon Keller, Aarbergen, and Peter Kreutz, Neuss, both of Fed. Rep. of Germany, assignors to Passavant-Werke Michelbacher Huette, Aarbergen, Fed. Rep. of Germany**

**Filed Jun. 23, 1980, Ser. No. 161,753**

**Claims priority, application Fed. Rep. of Germany, Jun. 23, 1979, 7918099[U]**

**Int. Cl.³ B04C *3/02*; B01D *45/12***

**U.S. Cl. 55—269** **2 Claims**



1. Apparatus for separating liquid and/or solid particles suspended in a gaseous and/or vaporous media stream by means of centrifugal force having a curved channel defined by a wall and through which the media stream flows and having a turbulence chamber defined by a wall and connected to the concave side of the curved channel and accommodating a partial stream of the media stream, and having at least one discharge opening for the particles separated from the partial stream and at least one exhaust opening for the particle-free fraction of the partial stream, with at least one of the walls of the curved channel and the turbulence chamber being provided with a cavity for the passage of a heat or cooling transfer medium and said apparatus embodies a plurality of separator devices arranged in staggered relationship to each other with each comprising a curved channel and a turbulence chamber, the improvement in that at least one section of the wall of a turbulence chamber and one section of the interior wall of said

channel, simultaneously constitutes at least one section of the exterior wall of the channel of an adjacent separator device, and defines common wall sections of double-walled construction.

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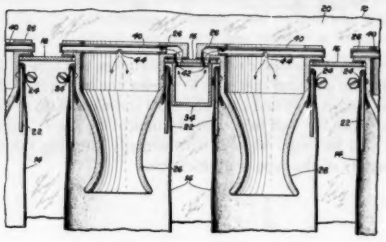
**4,298,360**
**PULSED AIR FILTER CLEANING SYSTEM**
**Leif W. Poll, 7 Dalewood Rd., W. Caldwell, N.J. 07006**
**Filed Feb. 2, 1981, Ser. No. 230,650**
**Int. Cl.³ B01D *46/04***
**U.S. Cl. 55—273** **10 Claims**



1. An air cleaning system comprising:
a housing including an inlet for receiving dust-laden air and an exhaust chamber having an outlet for exhausting clean air;
a filter chamber including a plurality of filter bags positioned between said inlet and outlet for cleaning said air;
a platform extending across said housing and separating said filter chamber and inlet from said exhaust chamber and outlet, said platform including a plurality of openings holding and sealing said filter bags, said bags having open ends communicating with said exhaust chamber through said platform openings; and
means for cleaning said filter bags including a tubular channel secured below said platform adjacent said filter bags,
a plurality of conduits extending over the open ends of said filter bags, each said conduit having an orifice facing respective said open ends of said filter bags, a plurality of passages connected through said tubular channel and platform to respective said conduits,
a source of compressed air connected to said tubular channel,
control means for periodically applying pulses of said compressed air through said tubular channel and passages and through said conduits and orifices to direct said air pulses in a reverse direction into said filter bag open ends to remove dust from the outer surfaces of said bags, and
means for collecting said dust removed from said bags.

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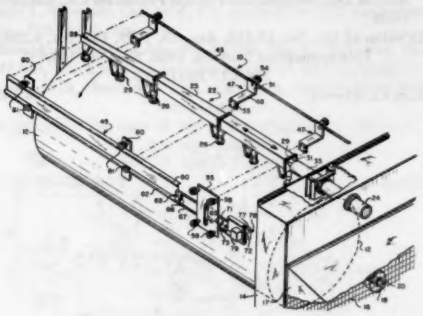
**4,298,361**
**ROTARY DRUM FILTER STRIPPER NOZZLE MOUNTING**
**Hovan Hocutt, and David M. Ford, both of Charlotte, N.C., assignors to Pneumafil Corporation, Charlotte, N.C.**
**Filed May 19, 1980, Ser. No. 151,344**
**Int. Cl.³ B01D *46/04***
**U.S. Cl. 55—290** **8 Claims**

1. In a rotary drum filter in which a rotating cylindrical drum is provided with a filter surface through which air passes from the exterior to the interior of the drum, and at least one nozzle is positioned to move over the filter surface to strip foreign matter accumulating thereon, a mounting for the at least one nozzle, said mounting comprising an elongate relatively rigid walled duct extending along an axis spaced from and parallel to the drum axis; a stationary portion of said duct mounted at one end of the drum; and a traversing portion of said duct mounted along the drum and telescoping with respect to said stationary portion, said traversing portion supporting the at least one nozzle, and drive means coupled to said traversing portion to effect movement thereof.



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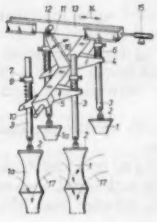
**4,298,362**
**FILTER CLEANING DEVICE**
**Walther Krull; Alfred Bekaan, and Wolf-Dieter Schiller, all of Lübeck, Fed. Rep. of Germany, assignors to Beth GmbH, Lübeck, Fed. Rep. of Germany**
**Filed Apr. 17, 1980, Ser. No. 141,146**
**Claims priority, application Fed. Rep. of Germany, Apr. 17, 1979, 2915958**
**Int. Cl.³ B01D *46/04***
**U.S. Cl. 55—304** **9 Claims**



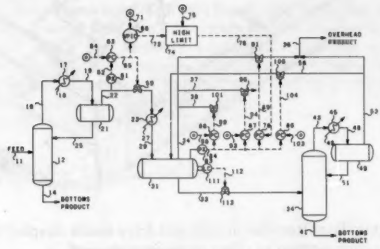
1. A filter installation comprising:
at least two rows of spaced-apart filter tubes;
a rocker pivotal about a horizontal axis between said rows and having respective arms disposed above each of said filter tubes and assigned thereto;
respective resilient oscillatory links connecting each of said arms with a respective filter tube whereby each resilient link forms a vibratile suspension with the respective filter tube, each of said links includes:
a respective support member swingably connecting each of said filter tubes with a respective one of said arms and allowing relative longitudinal movement of the respective arm and tube, and
a respective spring surrounding each of said support members; and
means for angularly displacing said rocker about said axis to expand and contract said filter tubes to dislodge collected material therefrom.

4,298,363

## FRACTIONATOR FEED TANK PRESSURE CONTROL

Grover L. Campbell, Old Ocean, and James W. Hobbs, Sweeny, both of Tex., assignors to Phillips Petroleum Co., Bartlesville, Okla.

Division of Ser. No. 69,154, Aug. 23, 1979, Pat. No. 4,239,517.
This application May 16, 1980, Ser. No. 150,492
Int. Cl.[3] B01D *3/42*
U.S. Cl. 62—21 8 Claims




1. A method for controlling a multi-stage fractional distillation process in which the overhead product from a first fractional distillation column is supplied from a first overhead assumulator associated with said first fractional distillation column through a first control valve to a feed tank for a second fractional distillation column comprising the steps of:

establishing a first signal representative of the pressure in said first accumulator;

establishing a second signal representative of the desired pressure in said first accumulator;

using a computing means to establish responsive to said first signal and said second signal, a third siganl responsive to the difference between said first signal and said second signal;

manipulating said first control valve in response to said third signal to thereby maintain a desired pressure in said first accumulator;

establishing a fourth signal representative of a desired valve position for said first control valve;

using a computing means to establish responsive to said third signal and said fourth signal, a fifth signal responsive to the difference between said third signal and said fourth signal;

establishing a sixth signal representative of the pressure in said feed tank;

using a computing means to establish responsive to said fifth signal and said sixth signal, a seventh signal responsive to the difference between said fifth signal and said sixth signal; and

manipulating the pressure in said feed tank in response to said seventh signal, the pressure in said first overhead accumulator and the pressure in said feed tank being manipulated so as to maintain a desired valve position for said first control valve.

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4,298,364

## METHOD OF MAKING OPTICAL FIBERS HAVING IMPROVED CORE ROUNDNESS

Paul E. Blaszyk, Big Flats, and Susan F. Murphy, Corning, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Mar. 17, 1980, Ser. No. 131,169
Int. Cl.[3] C03B *23/07, 37/025, 37/07, 37/075*
U.S. Cl. 65—3.11 6 Claims

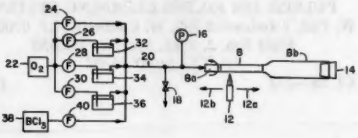
1. In the method of manufacturing an optical waveguide preform which includes the steps of

providing a cylindrical glass bait tube, and

forming at least one layer of glass on the inner surface thereof, the improvement which comprises subjecting said bait tube to the following steps prior to the time said layer is formed:

heating said bait tube,

providing a positive pressure within said bait tube, decreasing the diameter of said bait tube by at least one mm to form a shrunken tube, and




increasing the pressure within said shrunken bait tube so that the tube diameter increases to at least one mm greater than the diameter of said bait tube in its shrunken state to form an expanded bait tube, thereby improving the roundness of said bait tube without detrimentally affecting the uniformity of the tube wall thickness.

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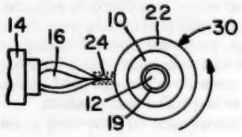
4,298,365

## METHOD OF MAKING A SOOT PREFORM COMPOSITIONAL PROFILE

Alan C. Bailey, Painted Post, and Alan J. Morrow, Elmira, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Jul. 3, 1980, Ser. No. 165,652
Int. Cl.[3] C03B *19/06, 37/025, 37/075*
U.S. Cl. 65—3.12 13 Claims




1. A method of forming a high purity glass article comprising the steps of

providing a substantially cylindrical mandrel,

applying to said mandrel a stratum of low viscosity glass soot,

applying a first coating of glass soot to the outside peripheral surface of said stratum,

applying a second coating of glass soot over the outside peripheral surface of said first coating, the glass soot of said second coating having a refractive index less than that of the glass soot of the first coating, the viscosity of said second coating being greater than that of said first coating and the viscosity of said first coating being greater than that of said stratum at the consolidation temperature of said second coating,

removing said mandrel to form a soot preform having an aperture therein, the thickness of said stratum being sufficiently great that a continuous layer of said low viscosity material remains on the inner surface of said first coating after the step of removing said mandrel has been completed, and

forming the structure so formed into a desired glass article.

4,298,366

## GRADED START RODS FOR THE PRODUCTION OF OPTICAL WAVEGUIDES

Franklin W. Dabby, Woodbridge, and Ronald B. Chesler, Cheshire, both of Conn., assignors to Times Fiber Communications, Inc., Wallingford, Conn.

Filed Jul. 13, 1979, Ser. No. 57,519
Int. Cl.[3] C03C *37/075;* G02B *5/172*
U.S. Cl. 65—3.12 8 Claims

1. A process for the production of optical waveguides which comprises preparing a preform by depositing and sintering borosilicate particles on a cylindrical glass rod, heating said preform to the drawing temperature and drawing said preform into optical waveguides, wherein said cylindrical glass rod comprises a central area of constant refractive index and an outer region of varying refractive index and wherein said cylindrical glass rod is prepared by the process comprising depositing and sintering borosilicate particles on a pure fused silica glass rod and drawing the resulting composite to obtain a graded start rod of about the same diameter as the original pure fused silica rod.

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4,298,367

## METHOD OF AND DEVICE FOR CLEANSING IN A FIBRE BLANKET MANUFACTURING PLANT

Jean Descolas, Le Pecq, France, assignor to Aktiebolaget Svenska Flaktfabriken, Sweden

Filed Jul. 1, 1980, Ser. No. 165,031
Claims priority, application France, Jul. 2, 1979, 79 17133
Int. Cl.[3] C03B *37/07*
U.S. Cl. 65—4.1 11 Claims

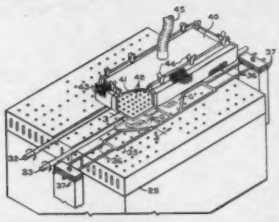
1. A method of cleansing, in a plant for manufacturing a blanket from fibres such as glass fibres or rock fibres which are thrown or set together with polymerizable binder particles or droplets onto a perforated conveying belt, consisting in associating means for sucking air loaded with fibre dust and binder particles or droplets with means for spraying a washing liquid such as water and then processing this washing liquid, wherein the improvement consists in positioning below said conveying belt series of Venturi nozzles having throats with adjustable cross-sectional passageway surface areas, opening into a duct connected to suction means, and distributor manifolds for spraying washing liquid at low pressure such as water arranged on the one hand at the inlets of said Venturi nozzles and on the other hand downstream of the outlets of said Venturi nozzles to provide a streaming of liquid onto all the walls of the dust removing ducts or means on which dusts and binder are likely to settle down.

4,298,368

## DELIVERING AND ALIGNING GLASS SHEETS IN A BENDING STATION

Samuel L. Seymour, Oakmont, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 44,425, Jun. 1, 1979, Pat. No. 4,233,049, which is a continuation-in-part of Ser. No. 960,404, Nov. 13, 1978, abandoned. This application Apr. 28, 1980, Ser. No. 144,481
The portion of the term of this patent subsequent to May 27, 1997, has been disclaimed.
Int. Cl.[3] C03B *23/035*
U.S. Cl. 65—25.2 7 Claims




1. A method of delivering and aligning glass sheets within a bending station, comprising the steps of:

engaging the entire width of a glass sheet heated to approximately its softening point with an upstream conveyor roll rotating about an axis extending normal to a path of travel along a gas support bed;

engaging the entire width of said glass sheet with a downstream rotating conveyor roll spaced longitudinally of said upstream conveyor roll for at least a portion of the time said upstream conveyor roll engages said glass sheet,

applying hot gas to the bottom surface of said glass sheet while engaging said glass sheet with at least one of said rotating rolls,

thereby delivering said glass sheet with its leading edge in more approximate alignment and orientation with alignment means than if said glass sheet were delivered within said bending station on less than two rotating rolls.

4. Apparatus for orienting and aligning a glass sheet while delivering said glass sheet to a bending station along a path of travel on a gas support bed comprising

means for supporting said glass sheet on a layer of hot gas along said path of travel,

an upstream conveyor roll and a downstream conveyor roll extending completely across said path of travel and mounted for rotation about axes extending normal to said path of travel at an elevation to contact the lower surface of said glass sheet and longitudinally spaced from one another along said path of travel a distance less than the length of said glass sheet for rotatably engaging said glass sheet along said path of travel simultaneously for at least a portion of the length of said glass sheet,

means for rotating said rolls in unison while both rolls drivingly engage said glass sheet completely across its width along lines spaced longitudinally of said path of travel, and

aligning means for engaging the leading edge of said glass sheet located downstream of said downstream conveyor roll and spaced longitudinally from said downstream conveyor roll a longitudinal distance approximately the length of said glass sheet,

whereby the simultaneous rotating engagement of said conveyor rolls on said gas supported glass sheet en route to said aligning means minimizes the amount that the glass sheet is misoriented and/or misaligned en route to nest with said aligning means and said upstream and downstream rolls are longitudinally spaced from one another a distance sufficient to provide minimum interference with

the supply of gas from said gas support bed against the surface of said glass sheet engaged by said rolls.

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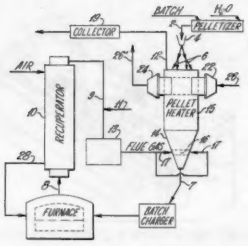
**4,298,369**

## GLASS MANUFACTURING PROCESS HAVING BORON AND FLUORINE POLLUTION ABATING FEATURES

**Magnus L. Froberg, Granville, and Charles F. Schroeder, Toledo, both of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio**

**Filed Mar. 31, 1980, Ser. No. 135,061**
**Int. Cl.³ C03B 5/16**
**U.S. Cl. 65—27** **7 Claims**




1. In a glass manufacturing process comprising combining glass batch ingredients, including a source of fluorine and boron, with water into agglomerates, conveying hot, boron and fluorine containing, effluent gases from above a pool of molten glass to a bed of agglomerates and passing said gases directly thereto so as to preheat said agglomerates to a temperature in excess of at least about 500° C., feeding said preheated agglomerates to a glass melting furnace and melting said agglomerates therein, the improvement comprising introducing a fluorine and boron reactive alkaline earth metal oxide, or a precursor of said oxide, into said hot gases prior to passing said gases through said bed of agglomerates, reacting fluorine and boron in said gases and said reactive material at a temperature in excess of about 500° C. and recovering a reaction product thereof in said bed upon passage of said gases therethrough.

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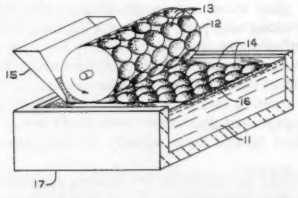
**4,298,370**

## METHOD OF IMPROVING GLASS MELTING BY ABLATION ENHANCEMENT

**Joseph J. Hammel, O'Hara Township, Allegheny County, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.**

**Filed Jun. 2, 1980, Ser. No. 155,802**
**Int. Cl.³ C03B 1/00, 3/00, 5/235**
**U.S. Cl. 65—27** **17 Claims**




1. In a method of melting glass wherein particulate glass batch materials are fed onto a pool of molten glass within a heated enclosure where the batch floats as a layer on the pool of molten glass until rendered liquid by the heat within the enclosure, the improvement comprising: creating at spaced intervals across the batch layer a plurality of tapered holes having sloped surfaces of compacted batch and extending substantially through the thickness of the batch layer without substantially increasing the thickness of the batch layer.

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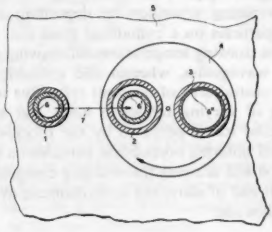
**4,298,371**

## PROCESS AND APPARATUS FOR MAKING HOLLOW GLASSWARE

**Werner D. Knoth, Byfangerstr. 175, 4300 Essen 15, and Helmut Münker, Rüstermark 27, 4300 Essen 1, both of Fed. Rep. of Germany**

**Filed Nov. 23, 1979, Ser. No. 96,744**
**Int. Cl.³ C03B 9/00, 9/18**
**U.S. Cl. 65—79** **3 Claims**



1. A process for mass-producing hollow glass articles, comprising the steps of:

(a) forming a hot first parison from a gob of molten glass in a premold;

(b) transferring said first parison in its heated state to a first final mold;

(c) forming a hot second parison from a gob of molten glass in said premold while letting said first parison cool in said first final mold;

(d) transferring said second parison in its heated state to a second final mold;

(e) forming a hot third parison from a gob of molten glass in said premold while letting said second parison cool in said second final mold and blowing said first parison in said first final mold into a shaped article; and

(f) after removal of said shaped article from said first final mold, repeating the preceding steps.

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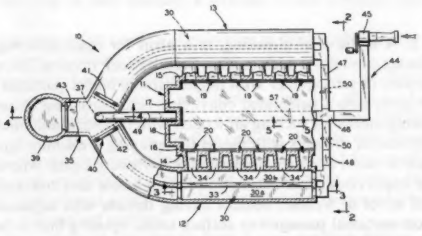
**4,298,372**

## COMBUSTION AIR FLOW CONTROL FOR REGENERATORS

**K. Lawrence Stover, Genoa; Alejandro G. Bueno, Toledo; James W. Miller, Rossford, and Donald E. Shamp, Millbury, all of Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio**

**Filed Feb. 22, 1980, Ser. No. 123,559**
**Int. Cl.³ C03B 5/44**
**U.S. Cl. 65—136** **8 Claims**



1. In a method of supplying combustion air to the elongated regenerators spaced along each side of a regenerative tank-type glass melting furnace for improving their operating efficiency, the tank having a charging end to which batch materials are supplied and a delivery end from which molten glass is

withdrawn, the regenerators being in communication with a plurality of ports spaced along the furnace and of the type including elongated checker brick structures having plenum chambers spaced above and below and extending throughout the length of the checker brick structures and with an upstream end toward the charging end of said tank and a downstream end toward the delivery end thereof, wherein incoming combustion air is admitted to the lower plenum chamber and rises through the checker brick structure to the upper plenum chamber during the firing cycle of the furnace, the improvement comprising the steps of:

a. simultaneously supplying combustion air to both ends of the lower plenum chamber of the regenerator supplying combustion air to the furnace during the firing cycle;

b. admitting a substantial portion of the combustion air into the downstream end of the lower plenum chamber of the regenerator; and

c. admitting a lesser portion of the combustion air into the upstream end of the lower plenum chamber of said regenerator whereby the opposed flow of combustion air tends to minimize localized overheating and equalize the operating temperatures of said regenerator throughout its length.

3. In a reversing regenerative glass melting furnace of the type comprising a tank wherein batch materials are supplied at a charging end and molten glass is withdrawn at a delivery end, and including a melting zone having a plurality of ports spaced along each of two opposite sides thereof, each said plurality of spaced ports being connected to an elongated regenerator extending along the side of said furnace with an upstream end toward the charging end of said tank and a downstream end toward the delivery end thereof, said regenerator being alternately placed in communication with a source of combustion air during its firing cycle and an exhaust flue during its exhaust cycle, the improvement comprising:

a. combustion air inlet means at each said end of said regenerator;

b. means for supplying a substantial portion of the combustion air through said inlet means to the downstream end of the regenerator during its firing cycle; and

c. means for supplying a lesser portion of the combustion air through said inlet means to the upstream end of said regenerator during the firing cycle whereby the opposed flow of combustion air tends to minimize localized overheating and equalize temperatures throughout the length of said regenerator.

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**4,298,373**

## APPARATUS FOR CUSHIONING THE MOTION OF RECIPROCATING MEMBERS

**Eustace H. Mumford, Ottawa Lake, Mich., and Jack I. Perry, Sylvania, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio**

**Filed Jan. 14, 1980, Ser. No. 112,012**
**Int. Cl.³ C03B *9/04;* F01B *9/00***
**U.S. Cl. 65—260** **13 Claims**

7. Apparatus for decelerating the motion of a take-out mechanism on a glass container forming machine, comprising:

a reciprocating pneumatic motor having a piston rod extending therefrom;

a first rack gear carried by the extending end of said piston rod;

a pinion in engagement with said rack gear;

means supporting said pinion for rotation about a horizontal axis and means connecting said pinion to a take-out arm;

a second rack in engagement with said pinion at a diametrically opposed portion thereof and confined to vertical movement;

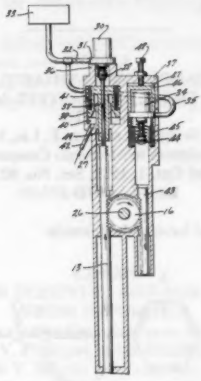
said second rack being moved axially in equal but opposite amounts as said first rack;

a first decelerator mounted above, in axial alignment with said first rack;

a rod extending from above the upper end of said first rack to a position just short of said first decelerator;

axially movable means for supporting and guiding said rod for axial movement, said rod engaging said first rack upon vertical movement of said rack a predetermined amount;

said rod acting against said first decelerator when said first rack approaches the maximum extent of its upward movement;



a second decelerator in axial alignment with said second racks; and

means mounting said second decelerator in vertical alignment with the path of movement of said second rack, whereby said second decelerator will cushion the movement of said piston rod in a downward direction by engagement thereof by said second rack.

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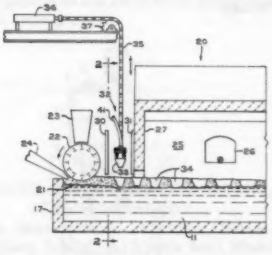
**4,298,374**

## APPARATUS FOR IMPROVING GLASS MELTING BY PERFORATING BATCH LAYER

**Edward P. Savolskis, and Walter W. Scott, both of Carlisle, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.**

**Filed Jun. 16, 1980, Ser. No. 159,528**
**Int. Cl.³ C03B *1/00, 3/00, 5/235***
**U.S. Cl. 65—335** **7 Claims**



1. In a furnace for melting glass including a heated enclosure containing a pool of molten glass, an inlet opening in the enclosure and means for feeding a layer of glass batch materials onto the surface of the molten glass through the inlet opening, the improvement comprising means for producing a series of holes in the batch layer including: support means extending across and above a substantial portion of the batch layer, a plurality of hole-shaping members extending downwardly from spaced-apart locations along the support means, at least a lower portion of each member provided with a three-dimensional shape

corresponding generally to the shape of a hole to be produced in the batch layer, the shape having a relatively wide upper portion and a relatively narrow lower portion with tapering side surfaces therebetween oriented to produce lateral compaction of batch upon vertical insertion into the batch layer, means for vertically reciprocating the support means and the hole-shaping members carried thereon between a raised elevation above the batch layer and a lowered elevation at which the hole-shaping members penetrate a substantial portion of the thickness of the batch layer, and means for cooling the hole-shaping members.

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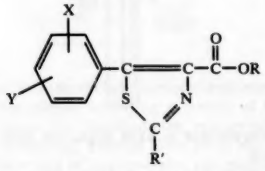
**4,298,375**

## 2-SUBSTITUTED-5-PHENYL-4-THIAZOLECARBOXYLIC ACIDS AND THEIR DERIVATIVES AS SAFENING AGENTS

**Robert K. Howe, Bridgeton, and Len F. Lee, Maryland Heights, both of Mo., assignors to Monsanto Company, St. Louis, Mo.**

**Filed Oct. 1, 1979, Ser. No. 80,749**
**Int. Cl.³ C07D 277/20**
**U.S. Cl. 71—90** **32 Claims**

1. A compound having the formula




wherein R is hydrogen, lower alkyl, halo(lower)alkyl, lower alkenyl, halo(lower)alkenyl or agriculturally acceptable cations; R' is halo, amino, lower alkoxy or phenylthio. X and Y independently equal hydrogen, lower alkyl, lower alkoxy, trifluoromethyl or halo moieties; provided that when R is hydrogen or lower alkyl, R' may not equal amino.

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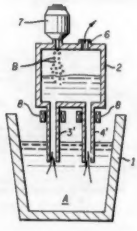
**4,298,376**

## METHOD FOR TREATING MOLTEN STEEL AND APPARATUS THEREFOR

**Kiichi Narita, Kobe; Takasuke Mori, Ashiya; Kenzo Ayata, and Takehisa Makino, both of Kobe, all of Japan, assignors to Kobe Steel, Ltd., Kobe, Japan**

**Filed Apr. 14, 1980, Ser. No. 139,655**
**Int. Cl.³ C21C 7/10**
**U.S. Cl. 75—49** **10 Claims**




1. A method for treating molten steel utilizing at least one induction coil, a ladle, a treating vessel and at least one passage pipe interconnecting said ladle and said treating vessel, which comprises:

positioning an induction coil around each of said passage pipes;

lifting up a part of said molten steel through each of said passage pipes from said ladel to said treating vessel disposed over said ladle through adjustment of molten steel composition in said treating vessel;

thereafter returning said molten steel to said ladle through each of said passage pipes;

circulating said molten steel between said ladle and said treating vessel while heating said molten steel by reversing direction of flow of said molten steel in each of said passage pipes by operation of each of said induction coils disposed around each of said passage pipes; and

operating each of said induction coils at a frequency of 50 to 60 cycles.

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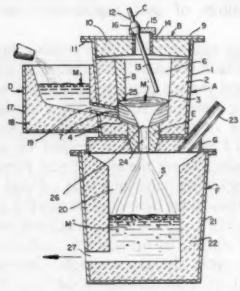
**4,298,377**

## VORTEX REACTOR AND METHOD FOR ADDING SOLIDS TO MOLTEN METAL THEREWITH

**Andrew G. Szekely, Yorktown Heights, N.Y., assignor to Union Carbide Corporation, New York, N.Y.**

**Filed Dec. 3, 1979, Ser. No. 99,583**
**Int. Cl.³ C22B 9/00**
**U.S. Cl. 75—53** **5 Claims**



1. A method for adding solid additives to molten metal comprising: feeding a stream of molten metal continuously into a vortex forming zone in such manner that the flow of metal in said zone is caused to rotate and to form a hollow-centered vortex, said method being characterized by:

(1) continuously feeding the solid additive to be admixed with the metal onto the surface of the rotating metal vortex,

(2) discharging the metal-additive mixture from said vortex forming zone in a controlled manner such that the mixture forms a free-falling, hollow-centered fluid stream, said stream remaining hollow-centered for its entire length, and

(3) collecting the discharged mixture in a receiving zone.

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**4,298,378**

## ROTARY STEEL CONVERTER, METHOD OF MAKING STEEL THERE-WITH AND METHOD OF APPLYING REFRACTORY LINING TO CONVERTER

**Keikichi Murakami, Kobe, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Hyogo, Japan**

**Filed Dec. 14, 1979, Ser. No. 103,619**
**Claims priority, application Japan, Dec. 22, 1978, 53-163691; Dec. 22, 1978, 53-163692**
**Int. Cl.³ C21C 5/50**
**U.S. Cl. 75—60** **12 Claims**

1. A steelmaking converter capable of both rotary and tilting motion, comprising:

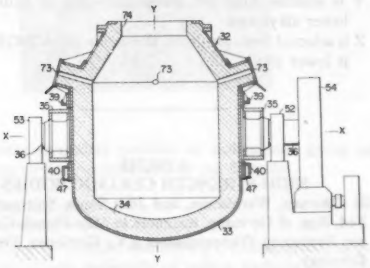
(a) a vessel (32), said vessel having a first axis (Y—Y) and two parallel axially spaced tires (39, 40) rigidly encircling the same;

(b) a trunnion ring (35) coaxially encircling the vessel;

(c) means (36, 52, 53) for supporting the trunnion ring (35) for rotary motion about a second axis (X—X) at right angles with the first axis (Y—Y);

(d) a plurality of radial support rollers (37) mounted on the trunnion ring (35) in two spaced annular rows, the radial support rollers (37) in each of the rows being distributed uniformly substantially throughout the circumference of the trunnion ring (35), said two rows of the radial support rollers (37) engaging said two tires (39, 40) in radial directions, respectively, to bear the radial load of the vessel (32) so as to permit rotation thereof about the first axis (Y—Y) relative to the trunnion ring (35);

(e) a plurality of axial support rollers (38) mounted on the trunnion ring (35) in two spaced annular rows, the axial support rollers (38) in each of the rows being distributed uniformly substantially throughout the circumference of the trunnion ring (35), said two rows of the axial support rollers (38) axially engaging said two tires (39, 40) respectively, to bear the axial load of the vessel while the rotation thereof about the first axis (Y—Y) relative to the trunnion ring (35);




(f) guide means (58) on the trunnion ring (35) for permitting said radial and axial support rollers (37, 38) to move toward and away from the associated tires (39, 40);

(g) biasing means (59) disposed within said guide means (58) to resiliently bias each of the radial and axial support rollers (37, 38) against the associated tires (39, 40); and

(h) drive means (43, 46, 42, 48) for rotating the vessel (32) about the first axis (Y—Y) relative to the trunnion ring (35), said drive means including a drive source (43) disposed within the trunnion ring (35), and a drive mechanism (41, 41*a*) operated by the drive source and associated with said vessel (32) to transmit the driving force to the same.

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**4,298,379**

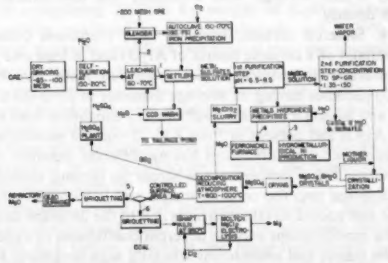
## PRODUCTION OF HIGH PURITY AND HIGH SURFACE AREA MAGNESIUM OXIDE

**Adolfo R. Zambrano, Hibbing, Minn., assignor to The Hanna Mining Company, Cleveland, Ohio**

**Filed Jan. 31, 1980, Ser. No. 117,224**

**Int. Cl.³ C01F *5/12*; C25C *3/04*; C22B *23/00*; C22C *33/00***

**U.S. Cl. 75—82** **22 Claims**



**1.** A process for the preparation of high surface area, high purity MgO from a solution of: sulfates of Mg, Ca, and other metals selected from the group consisting of Fe, Ni, Co, and Al; and impurities including B and Si, comprising the steps of:

(a) precipitating from the solution said other metals as hydroxides;

(b) separating the solution from the precipitate;

(c) concentrating the separated solution to a specific gravity of from about 1.35 to 1.5, whereby Ca, B, Si and residual impurities are precipitated;

(d) separating the concentrated solution from the precipitate;

(e) recovering dehydrated $MgSO_4$ crystals from the concentrated solution; and

(f) decomposing the dehydrated $MgSO_4$ crystals to form high purity MgO suitable for producing refractory materials.

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**4,298,380**

## PROCESS FOR PURIFYING LOW-MELTING METALS FROM IMPURITIES

**Ellin P. Bochkarev, ulitsa Ostrovityanova, 15, korpus 1, kv. 138, Moscow; Igor V. Prokopov, ulitsa Kalinina, 150, kv. 15, Pavlodar; Alexandr V. Eljutin, 3 Frunzenskaya ulitsa, 7, kv. 176, Moscow; Arkady A. Belsky, Komsomolsky prospekt, 48/22, kv. 20, Moscow; Svetlana M. Baryshnikova, ulitsa Udaltsova, 4, kv. 301, Moscow; Nail Z. Nasyrov, ulitsa Kuibysheva, 59, kv. 18, Pavlodar; Nikolai A. Novikov, 3 Institutskaya ulitsa, 15, kv. 49, Moscow; Edige R. Khairulin, ulitsa Kataeva, 54, kv. 6, Pavlodar; Mikhail S. Zvyagin, ulitsa Lenina, 4, kv. 219, Moskovskaya oblast, Reutovo; Vladimir N. Abrjutin, ulitsa Verkhnyaya Maslovka, 7, kv. 68, Moscow; Ljubov I. Konstantinova, ulitsa Glavmosstroya, 1, kv. 110, Moskovskaya oblast, Solntsevo; Nina A. Ljubimova, 11 Parkovaya ulitsa, 44, korpus 4, kv. 36, Moscow, and Nadezhda S. Gorbacheva, Tishinskaya ploschad, 6, kv. 51, Moscow, all of U.S.S.R.**

**Filed Feb. 14, 1980, Ser. No. 121,519**

**Int. Cl.³ C22B *43/00, 58/00***

**U.S. Cl. 75—101 BE** **10 Claims**

**1.** A process for purifying low-melting metals selected from the group consisting of gallium and mercury from metallic impurities comprises treating a melt of said metal with an aqueous solution of a compound selected from the group consisting of an inorganic acid and alkali in the presence of organic compounds with ionic groups.

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**4,298,381**

## ABRASION-RESISTIVE HIGH PERMEABILITY MAGNETIC ALLOY

**Mitsuhiro Kudo, Hamuramachi; Shigekazu Otomo, Hachioji; Hirotomo Ogihara, Sendai, and Yoshio Aoki, Hachioji, all of Japan, assignors to Hitachi Denshi Kabushiki Kaisha, Tokyo, Japan**

**Filed Dec. 18, 1979, Ser. No. 104,716**

**Claims priority, application Japan, Dec. 22, 1978, 53-157602**

**Int. Cl.³ C22C *38/06***

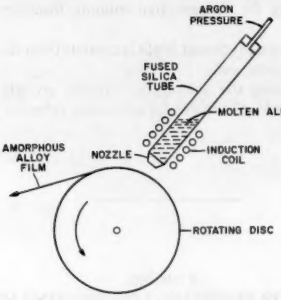
**U.S. Cl. 75—124** **4 Claims**

**1.** Abrasion-resistive, high permeability magnetic alloy consisting of 6–9 wt.% of Si, 7–11 wt.% of Al, 2–5 wt.% of Cr, 0.5–2 wt.% of Ti, 0.02–0.3 wt.% of at least one member selected from the group consisting of P and C and the balance of Fe.

## 4,298,382
## METHOD FOR PRODUCING LARGE METALLIC GLASS BODIES

**John L. Stempin, Beaver Dams, and Dale R. Wexell, Corning, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.**

**Filed Jul. 6, 1979, Ser. No. 55,176**
**Int. Cl.³ B22F** *1/00, 3/14*
**U.S. Cl. 75—202** **4 Claims**




1. A method for preparing large shapes of metallic glasses from precursor finely-dimensioned bodies thereof which comprises:

(a) placing said finely-dimensioned bodies in touching relationship with each other, and then

(b) hot pressing said bodies in a non-oxidizing environment at temperatures ranging from about 25° C. below the glass transition temperature to about 15° C. above the transition temperature of said metallic glass under an applied force of at least 1000 psi for a period of time sufficient to cause the bodies to flow and fuse together into an integral unit.

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## 4,298,383
## LOW VISCOSITY COMPOSITION FOR FORMING SHAPED BODIES

**John F. Joyce, Granger, Ind., assignor to National-Standard Company, Niles, Mich.**

**Filed Jun. 25, 1979, Ser. No. 52,010**
**Int. Cl.³ B22F** *1/00, 3/00*
**U.S. Cl. 75—211** **30 Claims**

1. A viscoelastic composition for forming shaped bodies comprising at least approximately 50% by weight of a reducible metal compound in particulate form, a binder, a dispersant, and water.

15. A method of making dense metal articles comprising the steps of:

(a) forming a shaped body from a viscoelastic composition comprising approximately 50% by weight of a reducible metal compound in particulate form, a binder, a dispersant, and water;

(b) exposing the shaped body to a reducing environment to reduce the metal compound to free metal particles; and

(c) subjecting the shaped body to a temperature sufficient to effect sintering of the free metal particles to produce a dense metal article.

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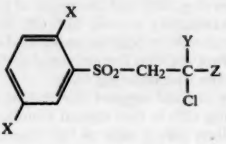
## 4,298,384
## ANTIFOULING PAINTS FOR MARINE USE

**Yael Allingham, and David Vofsi, both of Rehovot, Israel, assignors to Yeda Research and Development Company, Ltd., Rehovot, Israel**

**Filed Jul. 18, 1979, Ser. No. 58,707**
**Claims priority, application Israel, Jul. 23, 1978, 55203**
**Int. Cl.³ C09D** *5/14, 5/16*
**U.S. Cl. 106—18.34** **5 Claims**

1. An antifouling paint for marine use comprising a conventional paint base of the type used with antifouling paints, containing as active ingredient an effective quantity of a compound of the formula




wherein

X is selected from the group consisting of chlorine and bromine;

Y is selected from the group consisting of hydrogen and lower alkyl, and

Z is selected from the group consisting of —COOR where R is lower alkyl.

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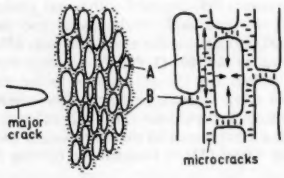
## 4,298,385
## HIGH-STRENGTH CERAMIC BODIES

**Nils Claussen, Warnbronn, and Jörg Steeb, Stuttgart, both of Fed. Rep. of Germany, assignors to Max-Planck-Gesellschaft zur Forderung Wissenschaften e.V., Gottingen, Fed. Rep. of Germany**

**Continuation of Ser. No. 4,120, Jan. 17, 1979, abandoned, which is a continuation-in-part of Ser. No. 738,409, Nov. 3, 1976, abandoned. This application Jul. 14, 1980, Ser. No. 167,898**
**Int. Cl.³ C04B** *35/00, 35/10, 35/40, 35/71*
**U.S. Cl. 501—105** **14 Claims**




1. A sintered ceramic body of high toughness, consisting of an isotropic ceramic matrix and at least one therein-dispersed phase of ceramic embedment material formed from a powder consisting of particles having an average diameter from 0.3 to 1.25 μm, wherein the ceramic embedment material is present in different enantiotropic solid modifications at the firing temperature of the ceramic body and below the firing temperature, whose densities are substantially different, and the ceramic body is shot through with extremely fine microfractures in high density.

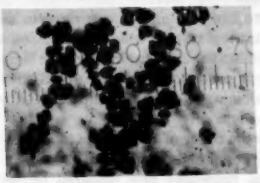
14. Sintered ceramic body of high toughness consisting essentially of a ceramic matrix of $Al_2O_3$ and at least one phase of ceramic embedment material formed from unstabilized $ZrO_2$ particles having an average diameter of from 0.3 to 1.25 μm and having a different coefficient of expansion from that of the $Al_2O_3$ and present in from 4 to 25 volume percent and in different solid modifications having different densities at and below the firing temperature, wherein the ceramic embedment is dispersed into the ceramic matrix and is thereafter shaped, fired and cooled to effect stresses due to the different densities of the modifications and the different coefficients of expansion of the matrix and embedment whereby high toughness results and wherein the ceramic body is shot through with extremely fine microfractures in high density.

4,298,386

## CALCIUM SILICATE AND PROCESS FOR PRODUCING SAME

Kazuhiko Kubo, Gifu; Akira Takahashi, Kagamihara, and Kenichi Oohashi, Mitaka, all of Japan, assignors to Kabushiki Kaisha Osaka Packing Seizosho, Osaka, Japan

Filed Sep. 17, 1979, Ser. No. 76,442
Claims priority, application Japan, Feb. 9, 1979, 54-14567
Int. Cl.[3] C01B *33/24*; C04B *21/00*
U.S. Cl. 501—80 25 Claims



1. Globular secondary particles of wollastonite group calcium silicate crystals represented by the formula

$$lCaO.mSiO_2.nH_2O$$

wherein $1 \leqq l \leqq 6$, $1 \leqq m \leqq 6$ and $0 \leqq n \leqq 1$, characterized in that the particles consist essentially of hollow globular secondary particles of the wollastonite group calcium silicate crystals, the globular secondary particles having an average spontaneous sedimentation height of at least 800 ml, an outside diameter of 5 to 110 μm, an average apparent density of 0.04 to 0.09 g/cm$^3$ and an average shell density defined by the equation

$$Y = 0.0033X + B$$

wherein Y is the average shell density, X is the average diameter of the particles, B is a constant, $15\ \mu m \leqq X \leqq 40\ \mu m$ and $0 \leqq B \leqq 0.115$.

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4,298,387

## AGGLOMERATED MIXTURES OF HIGHLY DISPERSED METAL OXIDES AND OPACIFIERS

Günter Kratel, Durach-Bechen; Hans Katzer, Munich; Stephan Loskot, Kempten; Wilfried Lang, Sulzberg, and Klaus Weis, Munich, all of Fed. Rep. of Germany, assignors to Consortium für Elektrochemische Industrie GmbH, Munich, Fed. Rep. of Germany

Filed Dec. 11, 1979, Ser. No. 102,510
Claims priority, application Fed. Rep. of Germany, Dec. 20, 1978, 2854984
Int. Cl.[3] C04B *35/52*
U.S. Cl. 501—92 7 Claims

1. In a process for the manufacture of an agglomerated mixture comprising 30–95% by weight of highly dispersed metal oxides produced by flame hydrolysis and 5–70% by weight of inorganic opacifiers that have at least one absorption maximum in the range between 1.5 and 10 μm, selected from the group consisting of inorganic oxides and mixed oxides, carbides and nitrides wherein volatile metal compounds are initially flame hydrolyzed in a combustion zone where they react with a flame to form highly dispersed metal oxides and are then agglomerated in an agglomeration plant, the improvement comprising the steps of:

continuously mixing said inorganic opacifiers with said flame-hydrolyzed metal oxides in the aforesaid percentages in a region in which the flame-hydrolyzed metal oxides are still in the form of primary particles; and

coagglomerating said inorganic opacifiers while agglomerating said metal oxides subsequent to the flame hydrolysis.

4,298,388

## ALKALI-FREE SEALING GLASSES FOR MOLYBDENUM

Werner Sack, Mainz, Fed. Rep. of Germany, assignor to Jenaer Glaswerk Schott & Gen., Mainz, Fed. Rep. of Germany

Filed Oct. 8, 1980, Ser. No. 194,979
Claims priority, application Fed. Rep. of Germany, Oct. 11, 1979, 2941215
Int. Cl.[3] C03C *3/04*
U.S. Cl. 501—15 3 Claims

1. $SiO_2$-$Al_2O_3$-alkaline earth oxide glass compositions suitable for glass/molybdenum sealings with high thermal load capability, having coefficients of thermal expansion in the temperature range of 20° to 300° C. of $4.6–5.1 \times 10^{-6}$/°C., glass transformation temperatures (Tg) of 775°–810° C., softening temperatures (Ew) greater than 930° C., processing temperatures ($V_A$) of 1232°–1273° C. and a length of $V_A$-Ew greater than 300° C. as regards processing technology of these glasses in the mixture, which consist essentially of the following components, computed as percent by weight oxides:

| | |
|---|---|
| $SiO_2$ | 57.00–64.00 wt % |
| $Al_2O_3$ | 12.50–16.50 wt % |
| $ZrO_2$ | 1.00–5.50 wt % |
| $Al_2O_3 + ZrO_2$ | 15.00–19.00 wt % |
| CaO | 11.50–19.20 wt % |
| BaO | 0–6.50 wt % |
| $CeO_2$ | 0–8.00 wt % |
| $TiO_2$ | 0–4.50 wt % |
| $CaO + BaO + CeO_2 + TiO_2$ | 18.60–25.70 wt % and |
| $As_2O_3$ | 0–0.30 wt % |

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4,298,389

## HIGH TRANSMISSION GLASSES FOR SOLAR APPLICATIONS

Lauren K. Johnson, Corning, and David A. Thompson, Horseheads, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Feb. 20, 1980, Ser. No. 123,047
Int. Cl.[3] C03C *3/08*
U.S. Cl. 501—77 2 Claims

1. A glass sheet suitable for use as a solar heliostat glass for a backside reflecting mirror demonstrating a solar transmission (350–2100 nm) through a 2.54 mm thickness in excess of 90%, which has a viscosity at the liquidus in excess of $10^5$ poises, a softening point of no more than about 760° C., an annealing point of no more than about 575° C., and a strain point of no more than about 535° C., which exhibits long term stability against devitrification when in contact with platinum and refractory ceramics, which is virtually unaffected by solarization, and which displays excellent resistance to weathering consisting essentially, expressed in weight percent on the oxide basis as calculated from the batch, of about

| | |
|---|---|
| $Al_2O_3$ | 7–13 |
| $B_2O_3$ | 7–10 |
| $Na_2O$ | 6–11 |
| CaO | 2–5 |
| $K_2O$ | 2–7 |
| $TiO_2$ | 0.1–1 |
| $As_2O_3$ | 0.2–1 |
| $Sb_2O_3$ | 0–1 |
| $SiO_2$ | Balance |

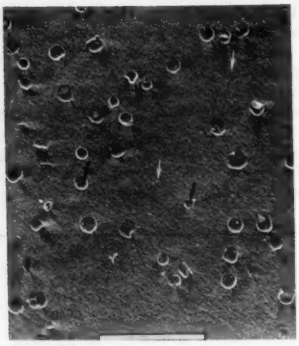
and also containing iron in the form of impurities up to 0.1%, expressed in terms of $Fe_2O_3$, wherein essentially all of the iron is present in the $Fe^{+3}$ state.

4,298,390

## FLUOROPHOSPHATE OPAL GLASSES

James E. Flannery, Corning; John L. Stempin, Beaver Dams, and Dale R. Wexell, Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Aug. 13, 1980, Ser. No. 177,627
Int. Cl.³ C03C *3/04, 3/08*
U.S. Cl. 501—32 2 Claims



1. A spontaneous opal glass demonstrating a dense white appearance, a softening point of at least 710° C., excellent chemical durability, and containing $Ba_2F(PO_4)$ as the predominant crystalline opal phase consisting essentially, expressed in terms of weight percent on the oxide basis, of 6–10% $Na_2O$, 1–6% $K_2O$, 4–11% BaO, 9–18% $Al_2O_3$, 1–5% $B_2O_3$, 50–70% $SiO_2$, 3.5–7% $P_2O_5$, and 1–4% F.

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4,298,391

## HOT REPAIR GUN REFRACTORY MIX FOR A LINING REFRACTORY

Masahiro Hayase; Hiroyuki Sugimoto, and Mitsuteru Takemoto, all of Okayama, Japan, assignors to Shinagawa Refractories Co., Ltd., Tokyo, Japan

Filed Dec. 31, 1979, Ser. No. 108,677
Claims priority, application Japan, Apr. 19, 1979, 54-47216
Int. Cl.³ C04B *35/52*
U.S. Cl. 501—89 12 Claims

1. A hot repair gun refractory mix comprising: (a) 5–70% by weight of a granulated material which includes a particulate carbonaceous substance having a particle size of 1 to 5 mm and containing 5 to 40% by weight of resin which is covered with a fine refractory powder by use of an water-soluble inorganic binder (b) 1 to 15% by weight of a binding plasticizer and (c) the remainder being refractory aggregrate and fine powder.

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4,298,392

## ACCELERATOR FOR SETTING OF CEMENTS

Piet H. Isselmann, Uithoorn, Netherlands, assignor to Akzona Incorporated, Asheville, N.C.

Filed Jun. 5, 1980, Ser. No. 156,824
Claims priority, application Netherlands, Jun. 11, 1979, 7904551
Int. Cl.³ C04B *7/02*
U.S. Cl. 106—98 12 Claims

1. An additive for hydraulic cement comprising of a silica sol and one or more compounds of the formula

R—S—C≡N

wherein for each compound, R is independently selected from the class consisting of alkali metals and alkaline earth metals.

4,298,393

## METHOD AND SYSTEM FOR BURNING FINE-GRAINED MATERIAL, PARTICULARLY FOR THE MANUFACTURE OF CEMENT CLINKERS

Kunibert Brachthäuser, Bergisch Gladbach, and Horst Herchenbach, Troisdorf, both of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed Aug. 2, 1979, Ser. No. 63,102
Claims priority, application Fed. Rep. of Germany, Aug. 2, 1978, 2833774
Int. Cl.³ C04B *7/44*
U.S. Cl. 106—100 4 Claims

1. In a method of calcining a raw meal in an installation having a pre-heating system which receives on the order of 65% of the total heat energy required for the sintering process and which feeds partly calcinated material to a rotary kiln wherein the calcining process is completed, an improvement comprising the steps of:

supplying on the order of 15% of the total heat requirement by burning fossil fuels in the kiln, and

supplying the remaining heat required by means of heat generators in the kiln that produce no exhaust gases.

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4,298,394

## ORGANIC GYPSUM SET ACCELERATORS

Peter A. Leeming; Dimitrios Mitakidis, and Peter F. Woodrow, all of Oakville, Canada, assignors to BPB Industries Limited, London, England

Filed Jun. 28, 1979, Ser. No. 52,754
Claims priority, application Canada, Jul. 26, 1978, 308157
Int. Cl.³ C04B *11/14*
U.S. Cl. 106—111 18 Claims

1. A gypsum set accelerator for use in the production of gypsum wallboard comprising gypsum incorporating an effective set accelerating increasing amount up to 20 percent by weight of the gypsum of at least one synthetic solid water-soluble detergent.

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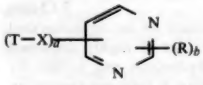
4,298,395

## ACTIVATED POLYMERIC CARRIERS

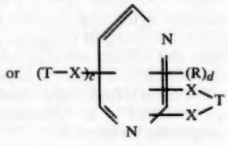
Dietrich Hildebrand, Odenthal, Fed. Rep. of Germany, and Thomas Gribnau, Nijmegen, Netherlands, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 792,295, Apr. 29, 1977, abandoned. This application Nov. 20, 1978, Ser. No. 962,360
Claims priority, application Fed. Rep. of Germany, May 3, 1976, 2619521
Int. Cl.³ C08L *1/02, 5/12;* C12N *11/06, 11/10*
U.S. Cl. 106—163 R 10 Claims

1. An activated polymeric carrier having at least one unit thereof of the formula:



or



wherein

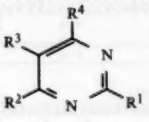
T represents atoms of the polymeric carrier selected from the group consisting of agarose, crosslinked dextran, cellulose, polyacrylamide and aminoethylated polystyrene resin;

X is a divalent oxygen or sulfur atom, —NH—, —NHR$^5$—, —CONH— or —CONR$^5$—, wherein R$^5$ is lower alkyl;

R is independently hydrogen, hydroxyl, lower alkyl, lower alkoxy, loweralkylthio, loweracylamino, nitro, cyano, carboxamide, loweralkylsulphonyl, loweralkoxycarbonyl, phenyl, trifluoromethyl or chloromethyl, provided that at least one R is halogen; and

a is 1 or 2, b is 4-a, c is 0 or 1 and d is 2-c.

5. A process for the production of the activated polymeric carrier of claim 1, in which a polymeric carrier containing at least one OH, —SH, —$NH_2$, —NHR$^5$ lower alkyl, —$CONH_2$ or —CONHR$^5$, in which R$^5$ is lower alkyl, is reacted in an organic or organic-aqueous solvent, at a temperature of between about −10° and about +30° C., with a halogenopyrimidine of the formula:



in which each of R$^1$, R$^2$, R$^3$ and R$^4$ is independently hydrogen, halogen, hydroxyl, lower alkyl, lower alkoxy, loweralkylthio, loweracylamino, nitro, cyano, carboxamido, loweralkylsulphonyl, loweralkoxycarbonyl, phenyl, trifluoromethyl or chloromethyl, provided at at least two of R$^1$ to R$^4$ is halogen.

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**4,298,396**

## PITCH COMPOSITIONS

**Abe Limonchik, Montreal, and Neil G. Richardson, St. Laurent, both of Canada, assignors to Domtar Inc., Montreal, Canada**

**Filed Apr. 21, 1980, Ser. No. 142,226**

**Int. Cl.$^3$ C08L *95/00***

**U.S. Cl. 106—273 R** **8 Claims**

1. A pitch composition comprising:

(a) a pitch material; and

(b) an active component comprising at least one of a class of: halogenated organic compounds which decompose at temperatures between the softening point and the carbonization temperature of the pitch material,

wherein said component is present in an amount effective to reduce significantly the carbon dioxide oxidation rate of the carbonization product of said pitch composition relative to the carbon dioxide oxidation rate of the carbonization product of said pitch material and constitutes at most 2% by weight of said composition.

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**4,298,397**

## ASPHALT-SULFUR EMULSION COMPOSITION

**Michael V. Burris, 1760 Industrial Rd., Las Vegas, Nev. 89102**

**Continuation-in-part of Ser. No. 1,536, Jan. 8, 1979, Pat. No. 4,211,575, which is a continuation-in-part of Ser. No. 726,946, Sep. 27, 1976, abandoned. This application Apr. 14, 1980, Ser. No. 139,639**

**The portion of the term of this patent subsequent to Jul. 8, 1997, has been disclaimed.**

**Int. Cl.$^3$ C08L *95/00*; C09D *3/24***

**U.S. Cl. 106—274** **13 Claims**

1. An asphalt-emulsion composition comprising:

an asphalt phase consisting essentially of between about 50 and about 98% paving grade asphalt, between about 1 and about 10% added sulfur over and above the amount of any residual sulfur in said asphalt, and between about 1 and about 35% of a liquid petroleum hydrocarbon having a boiling point above about 200° F., and

a water phase having between about 0.05 and about 10.0%, by weight, based on the total composition, of an emulsifier selected from the group consisting of cationic, anionic, and nonionic emulsifiers and mixtures thereof.

**4,298,398**

## PROCESS FOR CONVERTING PREMILLED CRUDE QUINACRIDONE TO PIGMENTARY FORM

**Patrick H. Fitzgerald, Pitman, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed Aug. 28, 1980, Ser. No. 181,958**

**Int. Cl.$^3$ C09B *48/00***

**U.S. Cl. 106—288 Q** **6 Claims**

1. A process for converting premilled crude quinacridone to pigmentary form by contacting the premilled quinacridone with an aqueous alkaline medium having a pH of at least 10 in an amount sufficient to intimately contact the premilled crude quinacridone at a temperature of at least 85° C. in the presence of at least one quaternary ammonium compound of the formula $(n\text{-}C_4H_9)_3R\text{-}N^+\ X^-$ where R- is —$CH_3$n-$C_4H_9$, —$CH_2C_6H_5$, —$C_2H_5$, or n-$C_3H_7$ and $X^-$ is $Cl^-$, $Br^-$, $I^-$,

$OH^-$, or $NO_3^-$, wherein the quaternary ammonium compound is present in an amount of from 2 to 15% by weight, based on the weight of the premilled crude quinacridone.

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**4,298,399**

## PROCESS FOR SALT GRINDING OF PIGMENTS

**Francis A. Formica, Tinton Falls, and James B. Izenberg, Metuchen, both of N.J., assignors to International Pigment Processing Corp., Paterson, N.J.**

**Filed Jun. 11, 1980, Ser. No. 158,615**

**Int. Cl.$^3$ B02C *23/18***

**U.S. Cl. 106—309** **7 Claims**

1. In a process in which a finely divided crystalline organic pigment is produced from a coarser crude crystalline organic pigment by grinding the coarse pigment in the presence of a water soluble inorganic salt as the grinding media and a water soluble conditioning agent as the grinding aid and thereafter separating the resulting finely divided organic pigment from said salt and said conditioning agent, wherein the proportion of inorganic salt to pigment is from about 3 and up to 20 parts by weight of salt for each part by weight or organic pigment, the improvement which comprises providing as the conditioning agent a water soluble viscous material selected from the group consisting of corn syrup, corn syrup solids and molasses and the proportion of conditioning agent to pigment is between about ¼ and 4 parts by weight of conditioning agent to each part by weight of organic pigment.

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**4,298,400**

## LOW D.E. STARCH CONVERSION PRODUCTS

**Frederick C. Armbruster, LaGrange, Ill., assignor to Grain Processing Corporation, Muscatine, Iowa**

**Division of Ser. No. 107,426, Jan. 18, 1971, Pat. No. 3,853,706, which is a continuation-in-part of Ser. No. 626,952, Mar. 30, 1967, abandoned. This application Jul. 12, 1974, Ser. No. 487,944**

**The portion of the term of this patent subsequent to May 16, 1989, has been disclaimed.**

**Int. Cl.$^3$ C13K *1/06***

**U.S. Cl. 127—29** **6 Claims**

1. A non-waxy cereal starch hydrolyzate having a dextrose equivalent value in the range from about 5 to about 20, and being characterized in that the observed value of A for a given product does not exceed by more than 25% the value of A that is calculated from one of the following equations for a product having the dextrose equivalent value of the given product, wherein A is the iodine absorbency value at 500 millimicrons expressed on a 5 centimeter cell basis and calculated to a concentration of 1 milligram of dry substance per milliliter:

Equation 1:

when the dextrose equivalent value is from about 5 to about 10:

$\log A = -0.1830$ dextrose equivalent value $+ 2.606$, and

Equation 2:

when the dextrose equivalent value is from about 10 to about 20:

$\log A = -0.0905$ dextrose equivalent value $+ 1.683$.

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**4,298,401**

## BREAKDOWN VOLTAGE RESISTOR OBTAINED THROUGH A DOUBLE ION-IMPLANTATION INTO A SEMICONDUCTOR SUBSTRATE, AND MANUFACTURING PROCESS OF THE SAME

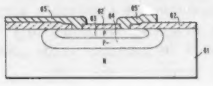
**Jean-Paul Nuez, Mennecy, and Gerard Lebesnerais, Perthes en Gatinais, both of France, assignors to International Business Machines Corp., Armonk, N.Y.**

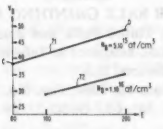
**Filed Nov. 19, 1979, Ser. No. 95,817**

**Claims priority, application France, Dec. 28, 1978, 78 37092**

**Int. Cl.³ H01L** *3/22, 21/265, 29/90*

**U.S. Cl. 148—1.5** **5 Claims**





1. A process of forming an implanted resistor in a semiconductor substrate of a first type of conductivity, comprising the following steps:

implanting a impurity of a second type of conductivity opposite to said first type of conductivity into a region of the substrate, at a first heavy dose within about $10^{12}$–$10^{15}$ at/cm$^2$, at a low energy within about 20–120 KeV in order to define the required value of the resistor and bring about a low TCR,

implanting an impurity of said second type of conductivity into said region, at a second dose within about $10^{11}$–$10^{14}$ at/cm$^2$, which is lighter than said heavy dose, and at a higher energy within about 120–400 KeV, in order to ensure an improved breakdown voltage without substantially modifying the required value of the resistor, and

annealing the substrate, the ratio of atoms implanted in said heavy dose to the atoms implanted in said lighter dose being at least about 10.

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**4,298,402**

## METHOD OF FABRICATING SELF-ALIGNED LATERAL BIPOLAR TRANSISTOR UTILIZING SPECIAL MASKING TECHNIQUES

**Hemraj K. Hingarh, San Jose, Calif., assignor to Fairchild Camera & Instrument Corp., Mountain View, Calif.**

**Filed Feb. 4, 1980, Ser. No. 118,291**

**Int. Cl.³ H01L** *21/265, 21/20*

**U.S. Cl. 148—1.5** **1 Claim**

1. A method for fabricating an integrated injection logic cell in a semiconductor body, said cell comprising a lateral bipolar injection transistor and a vertical bipolar transistor, comprising the steps of:

(a) forming a first layer of dopant masking material on a surface of said semiconductor body, said surface being of a first conductivity type, said first layer comprising a first tier of silicon oxide overlaying said surface, a second tier of silicon nitride overlaying said first tier, and a third tier of silicon oxide overlaying said second tier;

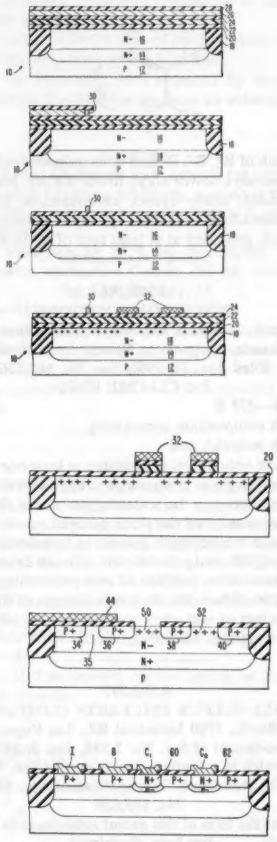
(b) forming a second layer of undoped polycrystalline silicon on said first layer of dopant masking material;

(c) forming a third layer of silicon oxide on the surface of the second layer;

(d) removing a portion of said third layer of silicon oxide and underlaying portion of said second layer of undoped polycrystalline silicon by photoresist masking and selective etching thereby exposing an edge portion of said second layer;

(e) diffusing dopant into said exposed edge portion of said second layer thereby forming a doped portion of said second layer;

(f) removing said third layer of silicon oxide;



(g) removing said undoped second layer by preferential etchant such that said doped portion of said second layer remains intact;

(h) implanting a dopant of opposite conductivity type into said surface of said semiconductor body using said doped portion of said second layer as an implant mask thereby forming surface regions in said semiconductor body of said opposite conductivity type separated by a surface region of said first conductivity type;

(i) selectively applying a resist over said first layer prior to said step of implanting a dopant of opposite conductivity type whereby a collector region of said vertical bipolar

transistor is masked from implanted dopant of opposite conductivity type;

(j) heating said silicon conductor body to drive in said dopant of opposite conductivity type and increasing the thickness of said silicon oxide over the surface region of implanted dopant of opposite conductivity type;

(k) removing said resist and first layer underlaying said resist;

(l) applying a resist layer overlaying the base region of said lateral transistor;

(m) immplanting dopant of opposite conductivity in said semiconductor body in the collector region of said vertical bipolar transistor; and

(n) diffusing dopant of first conductivity type into said exposed collector region.

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**4,298,403**

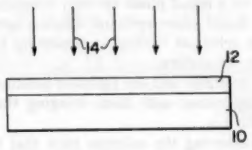
## ION-IMPLANTED EVAPORATED GERMANIUM LAYERS AS N+ CONTACTS TO GAAS

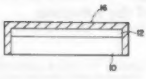
**John E. Davey, 3212 Wessynton Way, Alexandria, Va. 22309, and Aristos Christou, 7064 Leewood Forest Rd., Springfield, Va. 22151**

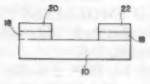
**Filed Feb. 28, 1980, Ser. No. 125,426**

**Int. Cl.³ H01L** *29/161, 23/48, 7/38, 21/265*

**U.S. Cl. 148—1.5** **11 Claims**




1. A method for forming $n^+$ contacts for GaAs devices which comprises:

depositing a p-type Ge film onto a GaAs substrate,

implanting ions of arsenic or phosphorous into said Ge film to a desired depth,

capping said Ge film on the top and sides and on the sides of the GaAs substrate with an oxide,

annealing said capped Ge film-GaAs substrate in an inert gas ambient at a sufficient temperature over a sufficient time period to over-compensate the p-type Ge layer to change the p-type layer to an $n^+$ layer,

removing the oxide cap,

etching said $n^+$ Ge film to form contact areas, and

depositing an ohmic metallization on the contact areas.

**4,298,404**

## CHROMIUM-FREE OR LOW-CHROMIUM METAL SURFACE PASSIVATION

**Joseph L. Greene, New Hudson, Mich., assignor to Richardson Chemical Company, Des Plaines, Ill.**

**Filed Sep. 6, 1979, Ser. No. 72,988**

**Int. Cl.³ C23C** *7/18, 9/00*

**U.S. Cl. 148—6.14 A** **31 Claims**

1. An acidic aqueous bath for the passivation treatment of a substrate having a metal surface, comprising: an organic activating agent, said organic activating agent being a carboxylic acid having between about 2 and about 12 carbon atoms and being selected from the group consisting of polyhydroxy carboxylic acids, polycarboxylic acids, bath-soluble derivatives thereof and combinations thereof, in combination with one or more bath-soluble film-forming agents, at least one of said agents being a chromium-free film-forming agent selected from the group consisting of fluoride salts, oxalate salts, malonate salts, succinate salts, and combinations thereof, said chromium-free film-forming agent including a nonchromium film-forming element that forms a thin, adherent and coherent hydrophobic passivation coating onto a substrate having a metal surface, said film-forming element being selected from the group consisting of aluminum, silicon, titanium, vanadium, iron, cobalt, molybdenum, cerium, and combinations thereof, said chromium-free film-forming agent being a bath-soluble fluoride complex including at least one of said non-chromium film-forming elements, and said organic activating agent, whether added as said film-forming agent, as said organic activating agent, or as any other bath additive, is present at a concentration up to about 0.3 weight percent, expressed as oxalic acid, per volume, based on the total bath volume, said bath including a strong acid and having an operative pH range between values high enough to avoid chemical polishing and etching of the metal surface and low enough to maintain a desired rate of passivation reaction.

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**4,298,405**

## PROCESS FOR PRODUCING IRON PHOSPHATE COATINGS AT AMBIENT TEMPERATURE

**J. Arthur Saus, Greenville, and Larry P. McCartney, Grier, both of S.C., assignors to Intex Products, Inc., Greenville, S.C.**

**Filed Mar. 24, 1980, Ser. No. 133,117**

**Int. Cl.³ C23F** *7/10*

**U.S. Cl. 148—6.15 R** **13 Claims**

1. A process for forming an iron phosphate conversion coating on a ferrous metal surface at ambient temperature, said process comprising applying at a temperature of from about 50° F. to about 100° F. to a ferrous metal surface an aqueous acidic phosphating solution having a pH within the range of 3 to 6 and comprising a source of phosphate consisting essentially of orthophosphate ions at a concentration of at least about 2.0 grams per liter and an ambient temperature activator comprising nitrite ions at a concentration of at least 0.08 grams per liter.

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**4,298,406**

## MANUFACTURE OF STEEL PRODUCTS

**Malcolm Brownlee, Middlesbrough, and Thomas C. Harrison, Bishop Aukland, both of England, assignors to British Steel Corporation, London, England**

**Continuation-in-part of Ser. No. 918,577, Jun. 23, 1978, abandoned. This application Nov. 13, 1979, Ser. No. 93,226**

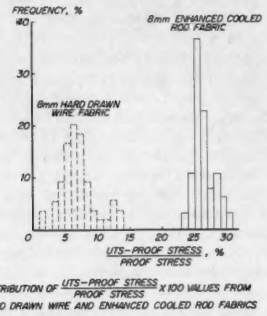
**Claims priority, application United Kingdom, Nov. 3, 1977, 45765/77**

**Int. Cl.³ C21D** *1/25, 8/08*

**U.S. Cl. 148—12 B** **8 Claims**

1. A process for the production of welded steel mesh for the reinforcement of concrete, including the steps of hot rolling in a rolling mill semi-killed or killed carbon-manganese steel rod having a manganese content of not more than about 0.78%, the rod exiting from the last stand of the mill with a temperature in

excess of 1000° C., superficially cooling the rod in water from this temperature to an equalisation temperature between 300° C. and 700° C. so as to produce a martensitic or bainitic outer surface layer, laying the rod on a moving conveyor in the form of flat overlapping non-concentric rings, cooling the rod in air




on the conveyor so as to temper the martensitic or bainitic layer, collecting the rings in coils and without effecting any drawing or mechanical working on the rod, arranging the rod in the form of a mesh, and welding the lengths of rod to one another where the rods overlap.

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**4,298,407**

## FLUX TREATED SOLDER POWDER COMPOSITION

**Barry E. Taylor, Youngstown, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed Aug. 4, 1980, Ser. No. 175,272**
**Int. Cl.[3] B23K *35/34***
**U.S. Cl. 148—24** **28 Claims**

1. A tin alloy solder powder composition comprising finely divided particles of tin alloy coated with a thin substantially continuous layer of an organic flux, sufficient to lower the electrical conductivity of and to obscure the eutectic metal domains on the surface of the alloy particles.

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**4,298,408**

## ALUMINUM-TITANIUM-BORON MASTER ALLOY

**C. Ray Langdon, Pottstown, and Alan R. Burkart, Reading, both of Pa., assignors to Cabot Berylco Inc., Reading, Pa.**

**Filed Jan. 7, 1980, Ser. No. 110,159**
**Int. Cl.[3] C22C *21/00***
**U.S. Cl. 148—32** **4 Claims**

1. A wrought master alloy having sufficient ductility to be worked into a continuous coil of ¼-inch rod and consisting essentially of, in weight percent; 7.5 to 10 titanium, 0.3 to 0.6 boron and the balance aluminum plus incidental impurities.

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**4,298,409**

## METHOD FOR MAKING IRON-METALLOID AMORPHOUS ALLOYS FOR ELECTROMAGNETIC DEVICES

**Nicholas J. DeCristofaro, Chatham; Alfred Freilich, Livingston, and Davidson M. Nathasingh, Stanhope, all of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.**

**Continuation-in-part of Ser. No. 101,934, Dec. 10, 1979, Pat. No. 4,249,969, which is a division of Ser. No. 42,472, May 25, 1979, Pat. No. 4,219,335. This application Mar. 25, 1980, Ser. No. 133,774**
**The portion of the term of this patent subsequent to Aug. 26, 1997, has been disclaimed.**
**Int. Cl.[3] H21D *1/04***
**U.S. Cl. 148—108** **7 Claims**

1. A method of enhancing the magnetic properties of a metal alloy which is at least 90 percent amorphous and consisting essentially of a composition having the formula $Fe_aB_bSi_cC_d$ wherein "a", "b", "c" and "d" are atomic percentages ranging from about 80.0 to 82.0, 12.5 to 14.5, 2.5 to 5.0 and 1.5 to 2.5, respectively, with the proviso that the sum of "a", "b", "c" and "d" equals 100, which method comprises the step of annealing said alloy at a temperature ranging from about 380°–410° C.

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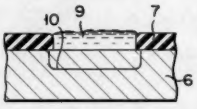
**4,298,410**

## METHOD FOR GROWING A LIQUID PHASE EPITAXIAL LAYER ON A SEMICONDUCTOR SUBSTRATE

**Koichiro Nakajima, Koganei, and Masaharu Watanabe, Yokosuka, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan**

**Filed Jun. 5, 1980, Ser. No. 156,593**
**Claims priority, application Japan, Jun. 6, 1979, 54-70145**
**Int. Cl.[3] H01L *21/208***
**U.S. Cl. 148—172** **3 Claims**




1. A method for selectively growing a liquid phase epitaxial layer based on a liquid phase epitaxy, comprising the steps of

arranging a liquid phase epitaxial solution apart from a semiconductor substrate having an insulating layer selectively formed on the surface,

heating the substrate and the epitaxial solution to a predetermined temperature and, then, bringing them into mutual contact,

selectively removing the solution such that the solution remains on the exposed surface of the substrate, with the insulating layer bearing substantially no solution, and

cooling the substrate and the solution at a predetermined cooling rate so as to grow a liquid phase epitaxial layer on the exposed surface of the substrate.

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**4,298,411**

## CROSSLINKED SMOKELESS PROPELLANTS

**James H. Godsey, Cumberland, Md., assignor to Hercules Incorporated, Wilmington, Del.**

**Filed Jul. 14, 1969, Ser. No. 842,088**
**Int. Cl.[2] C06B *45/10***
**U.S. Cl. 149—19.4** **13 Claims**

1. A smokeless crosslinked double-base propellant comprising by weight

(a) from about 7% to about 17.0% nitrocellulose,

(b) from about 27% to about 63% energetic plasticizer,

(c) from about 4% to about 12% of a crosslinking agent which is a prepolymer prepared by reaction of a hydroxy-terminated polyester and a diisocyanate,

(d) from about 0% to about 8% non-energetic plasticizer,

(e) from about 0.5% to about 6% of lead salt,

(f) from about 0.1% to about 0.9% carbon black, and

(g) from about 0% to about 60% of oxidizer comprising cyclotrimethylene trinitramine, cyclotetramethylene tetranitramine, and mixtures thereof.

4,298,412

## GAS GENERATOR COMPOSITION FOR PRODUCING COOL EFFLUENT GASES WITH REDUCED HYDROGEN CYANIDE CONTENT

Richard A. Biddle; Calvin W. Vriesen, both of Newark, Del., and Ernest S. Sutton, Landenberg, Pa., assignors to Thiokol Corporation, Newtown, Pa.

Filed May 4, 1979, Ser. No. 35,956
Int. Cl.[3] C06B *45/10*
U.S. Cl. 149—19.5 5 Claims

1. A gas generator composition which produces less than about 0.7 mole percent of HCN upon combustion consisting essentially of a binder component, a polynitrate ester plasticizer component, N,N'-dihydroxyethane diamide and about 2% to about 8% by weight of a HCN scavenger component selected from the group consisting of cupric oxalate, ferrous oxalate, hydrates of ferrous oxalate, $Fe_3O_4$ and mixtures thereof.

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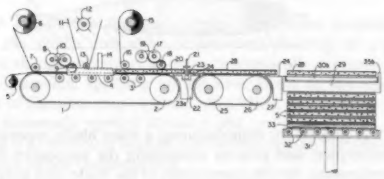
4,298,413

## METHOD AND APPARATUS FOR PRODUCING CONCRETE PANELS

John W. Teare, 26 Hollytree Ct., Hamilton, Ohio 45011

Filed Mar. 3, 1980, Ser. No. 126,192
Int. Cl.[3] B28B *1/16, 1/30, 5/02;* B65H *29/24, 29/26;* B29C *17/10*
U.S. Cl. 156—42 14 Claims



1. A process for producing fabric-reinforced concrete panels which comprises

depositing a web of disposable carrier material on a conveyer belt

laying down a continuous strip of fabric-concrete composite by successively depositing on said carrier web

a web of reinforcing fabric

a layer of hydraulic cement slurry

a core mix consisting of lightweight aggregate, hydraulic cement and water

a web of reinforcing fabric, and

a layer of hydraulic cement slurry

cutting said strip including said carrier web into individual panels

transferring each panel seriatim to an air-float stacking unit positioned over a stacking table adapted to support said panels, said stacking unit including an air-film cover of an air-frame having a slightly larger than panel size opening and a substantially confined space therebelow within which a cushion of air may be developed,

withdrawing rapidly the air-film cover from beneath the panel while providing air cushion under the panel in said space thereby obviating bowing or sagging of the panel in movement through the opening and into said space for stacking on said stacking table, and

transferring the stack of panels wherein each panel is separated from an adjacent panel in the stack by a layer of said disposable carrier material to a curing operation.

4,298,414

## METHOD OF FORMING THREE DIMENSIONAL RELIEF MAPS

Jean M. Latapie, 114 Avenue Jean de Noailles, 06400 Cannes, and Georges Pizzolitto, 96 Avenue des Arenes a, Nice Alpes Maritimes, both of France

Continuation of Ser. No. 839,934, Oct. 6, 1977, abandoned. This application Oct. 5, 1979, Ser. No. 82,167
Claims priority, application France, Oct. 14, 1976, 76 31458
Int. Cl.[3] B29C *27/14;* B44C *1/10;* G09B *29/12*
U.S. Cl. 156—59 4 Claims

1. A method of forming a three dimensional relief map comprising the steps of employing a predetermined number of identical planar maps having intervals of contour lines drawn thereon, cutting each map in sequence to provide from each of said maps a section defined along one edge by a first contour line and along a second edge by a second contour line spaced at a selected interval therefrom, with at least one contour line intermediate and less than the total extent of said map, the one edge of each section cut from each succeeding map in said sequence being defined by the next adjacent succeeding contour line in order from that of the one edge of the section cut from the preceding map until at least one section from each map is cut, and thereafter cyclically repeating the cutting of said maps in successive order until a selected number of successive sections are obtained, and thereafter superimposing said sections one on the other in order of the next adjacent succeeding contour line one upon the other until said relief map is completed.

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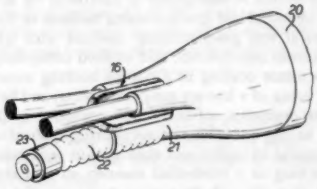
4,298,415

## BRANCH-OFF METHOD

Jean-Marie E. Nolf, Hamme-Mille, Belgium, assignor to N.V. Raychem S.A., Kessel-lo, Belgium

Filed Dec. 27, 1978, Ser. No. 973,614
Claims priority, application United Kingdom, Jan. 9, 1978, 631/78
Int. Cl.[3] B29C *27/24;* B32B *31/26*
U.S. Cl. 156—85 41 Claims




1. A method of forming a branch-off seal between a heat-shrinkable sleeve and at least two substrates, which comprises the steps of

(a) positioning a clip having elongate legs and formed as a trident over the heat-shrinkable sleeve at the end thereof so as to form at least two terminal conduits, wherein the central leg of the clip passes inside the heat-shrinkable sleeve;

(b) positioning the substrates within the conduits; and

(c) applying heat so as to effect shrinkage and to form the desired seal.

**4,298,416**

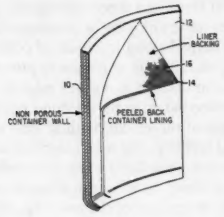
## PROTECTION OF SUBSTRATES AGAINST CORROSION

**Harold V. Casson, Kingston; Grant G. Crabtree, Napanee; Bruno Kindl, Kingston, and Edward B. Noonan, Kingston, all of Canada, assignors to Huron Chemicals Limited, Kingston, Canada**

**Continuation-in-part of Ser. No. 748,437, Dec. 8, 1976, abandoned. This application Apr. 5, 1979, Ser. No. 27,435**

**Int. Cl.³ B32B** *31/12;* **B65D** *25/14;* **B32B** *15/14, 17/06*

**U.S. Cl. 156—87** **30 Claims**




**1.** In a method of imparting improved corrosion resistance to a substrate which is susceptible to corrosion by action of a corrosive chemical containing and gas containing medium, with which said substrate comes into contact, wherein said substrate is coated with an elastomeric material of a known gas permeability, and which is resistant to the corrosive action of said corrosive chemical containing and gas containing medium and which coating prevents said corrosive medium from reaching said substrate and wherein said coating may suffer loss of adhesion caused by gas build-up between said coating and said substrate the improvement which comprises providing means for escape of said gases carrying gas build-up from between said coating and the supporting substrate, said means for escape of gases including a porous backing material upon which said elastomeric coating is deposited, said backing material being adhesively secured to said substrate and serving to prevent a build-up of said gases between said coating and said substrate which would tend to dislodge the coating from the substrate, and thereby maintaining the adhesive of the coating to the substrate, said elastomeric coating having a suitable viscosity during application to said porous backing material so that the rate of escape of gases through the porous backing will be substantially greater than the rate of permeation of gases through the coating.

**8.** A method of imparting improved corrosion resistance to a substrate which is susceptible to corrosion by action of a corrosive chemical and gas-containing medium or by a corrosive chemical and gas-generating medium with which said substrate comes into contact, said method comprising: applying an elastomer coating to a porous backing material, said elastomer being of a known gas permeability, and being resistant to the corrosive action of said corrosive medium, the elastomer having a suitable viscosity during application to said porous material to enable said elastomer to penetrate into the porous backing in a controlled manner, so that the rate of escape of gases through the porous backing will be substantially greater than the rate of permeation of gases through the coating, and adhesively securing said backing material to said substrate, said coating thereby preventing said corrosive medium from reaching the substrate, and said porous backing material providing means for escape of gases permeating said coating, from between said coating and the supporting substrate, said means for escape of gases serving to prevent a build-up of gases between said coating and said substrate which would tend to dislodge the coating from the substrate, whereby the adhesion of said coating to said substrate is maintained.

**10.** A method of imparting to a substrate improved resistance to corrosion thereof by a corrosive chemical and gas-containing medium or by a corrosive chemical and gas-generating medium, which method comprises:

(1) applying to a porous backing material an elastomeric coating having a permeability of at least $10^{-4}$ ml/cm² hr. atm. at room temperature for oxygen and an uncured elastomer viscosity of 100–2000 poises, and

(2) adhesively securing said porous backing to said substrate;

said porous backing providing means for escape of gases permeating said coating, from between said coating and the supporting substrate, said means for escape of gases serving to prevent a build up of gases between said coating and said substrate which would tend to dislodge the coating from the substrate, whereby the adhesion of said coating to said substrate is maintained.

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**4,298,417**

## METHOD OF MANUFACTURING A HELICOPTER ROTOR BLADE

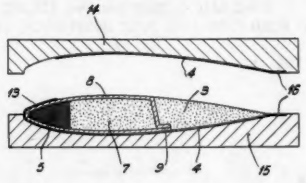
**August H. L. Euler, Aix-en-Provence, and Gilbert F. A. Beziac, Salon de Provence, both of France, assignors to Societe Nationale Industrielle Aerospatiale, France**

**Division of Ser. No. 879,915, Feb. 22, 1978, Pat. No. 4,213,739. This application Feb. 8, 1980, Ser. No. 119,912**

**Claims priority, application France, Feb. 28, 1977, 77 05767**

**Int. Cl.³ B32B** *1/10*

**U.S. Cl. 156—228** **1 Claim**




**1.** A process for manufacturing a rotor blade, especially for a helicopter, said process comprising the successive steps of impregnating certain components of the blade with polymerizable substances, placing said impregnated components in a single mould comprising two rigid partial moulds, one of which is a bottom partial mould and the other a top partial mould, the internal shape of each partial mould being adapted to the shape of the corresponding part of the blade with respect to variations of blade shape, thickness, chord and twist angle along a blade length, assembling said two partial moulds, and finally submitting the assembled mould to a thermal process for polymerizing the substances impregnating said blade components in the mould, and including the steps of

(a) placing seriatim in said bottom partial mould;

a lower-face part of a blade covering comprising also an upper-face part,

a lower-face part of a thick sheet of fabrics comprising also an upper-face part, and intended to subsequently form a torque-tube, said upper-face part being left unfolded outside of said bottom partial mould;

a substantially D-shaped bundle of strands of glass fibre filament having a rounded front face and a flat rear face and which is placed in the front part of said bottom partial mould and is intended to subsequently form a leading edge spar;

a core of a lightweight cellular substance, juxtaposed to the whole rear face of said D-shaped strand bundle;

(b) folding said upper-face part of said sheet of fabrics above said juxtaposed spar and core so as to wrap them up and preform a torque-tube;

(c) placing a cap on the front part of said preformed torque-tube intended to subsequently form the leading edge of the blade;

(d) placing a rear filling member in said bottom partial mould in juxtaposition to said folded sheet of fabrics;
(e) placing said upper-face part of said blade covering in said top partial mould;
(f) locking said top partial mould to said bottom partial mould; and
(g) placing the mould thus filled in an oven of about 120° C. to polymerize the impregnating substances of the blade components.

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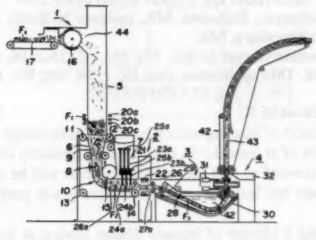
**4,298,418**
**METHOD AND APPARATUS FOR THE MANUFACTURE OF A LOCKED MATERIAL OF FILAMENT**
**Sadaaki Takagi, 39, Mikage-cho, Okazaki-shi, Aichi-ken, Japan**
**Filed Dec. 26, 1979, Ser. No. 107,364**
**Claims priority, application Japan, Dec. 29, 1978, 53/163086**
**Int. Cl.³ D04H *1/48***
**U.S. Cl. 156—296** **18 Claims**



1. A method for the manufacture of a locked material of filaments, which comprises compression molding in a prescribed shape short fibers of three-dimensionally crimped synthetic filaments, applying an adhesive liquid to the shaped article of filaments thus obtained, then lifting the shaped article in a substantially vertical direction and, at the same time, subjecting it to dielectric heating and thereby drying the adhesive adhering to the shaped article.

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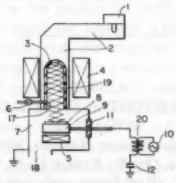
**4,298,419**
**DRY ETCHING APPARATUS**
**Keizo Suzuki; Sadayuki Okudaira; Shigeru Nishimatsu, all of Kokubunji, and Ichiro Kanomata, Fuchu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**
**Filed Jun. 26, 1980, Ser. No. 163,294**
**Claims priority, application Japan, Jul. 13, 1979, 54/88115**
**Int. Cl.³ C23F *1/02*; H01L *21/306*; C03C *15/00, 25/06***
**U.S. Cl. 156—345** **4 Claims**



1. A dry etching apparatus comprising: a vacuum volume formed with a gas inlet for introducing discharge gases and with a discharge room; magnetic field generating means for generating a magnetic field in said discharge room; microwave generating means for generating a microwave electric field in said discharge room; sample holding means for holding a sample to be worked in said vacuum room such that it is isolated from the earth; and AC voltage impressing means for impressing such an AC voltage upon said sample which has a frequency ranging from 100 KHz to 10 MHz.

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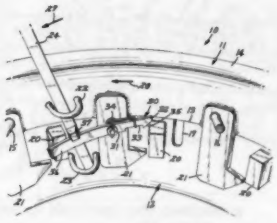
**4,298,420**
**LOCKING DEVICE FOR CURING RIMS**
**Larry A. Severson, West Fargo, N. Dak., assignor to Branick Mfg., Inc., Fargo, N. Dak.**
**Filed Mar. 27, 1980, Ser. No. 134,426**
**Int. Cl.³ B29H *5/02***
**U.S. Cl. 156—394 R** **3 Claims**



1. In a tire curing rim, in combination:
a rim assembly including first and second hollow cylindrical sleeves axially arranged for circumferential abutment along a contact circle and for relative rotation about the axis between a first, locking position and a second, release position;
means for preventing axial movement between said sleeves in said first locking position comprising a plurality of bosses projecting radially inward from said first sleeve adjacent said contact circle, and a plurality of hook members projecting axially beyond said contact circle inwardly of said second sleeve, for engagement with said bosses in said first position of said sleeves;
releasable latch means for preventing relative rotation of said sleeves out of said first position, said latch means comprising a latch hook pivotally mounted on said first sleeve for engagement with one of said bosses in said first position of said sleeves and resilient means for releasably urging said latch hook into engagement with said boss;
a pair of axially spaced rim loops projecting inwardly from said first and second sleeves respectively in substantially aligned circumferential relation when said sleeves are in said first position; and
a push bar received in said rim loops actuable to apply leverage between said sleeves about an axis generally orthogonal to the common axis of the sleeves causing said relative rotation of said sleeves, said push bar including means to disable said resilient means while applying said leverage.

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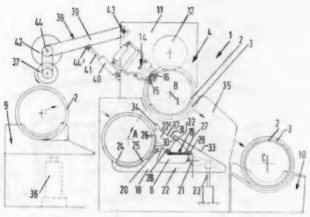
**4,298,421**
**DEVICE FOR APPLYING THE ELASTOMERIC FILLER TO THE BEAD CORE OF A TIRE**
**Dante Pirovano, Milan, Italy, assignor to Industrie Pirelli S.p.A., Milan, Italy**
**Filed Apr. 18, 1979, Ser. No. 31,299**
**Claims priority, application Italy, Apr. 19, 1978, 22448 A/78**
**Int. Cl.³ B29H *17/32***
**U.S. Cl. 156—460** **21 Claims**

1. Device for applying an elastomeric filler on the bead core of a tire, consisting of two discs with a common axis of rotation, which can be moved away from each other or brought together respectively to receive the bead core before the application of the filler and to unload the bead core with the filler and to form an annular seat designed to accommodate the bead core, the said device being characterised by the fact that it includes means for automatically loading the bead core from a first position to a second position in which the bead core is between the two discs with its center aligned with the common

axis of rotation, the said means having two jaws and means for controlling the opening of the jaws, the said two jaws rotating in relation to each other round a first hinge arranged on a suitable support rotating around a second hinge in order to bring the jaws from the first of the said positions to the second and vice versa, the said two hinges having axis of rotation parallel to the common axis of rotation of the two discs, the profile of the jaws when closed having surfaces corresponding to circle arcs of the radial profile of the bead core, the said surfaces of the jaws being provided with means for connecting



to the corresponding parts of the radially outermost periphery of the bead core, the said means for controlling the opening of the jaws being actuated when the bead core had already been locked in the annular seat between the two discs and the support is moved from the second of these positions to the first, and said means for controlling the opening of the jaws having an element for controlling the rotation of the first jaw, the path of which from the second of these positions to the first meets the external profile of the bead core, the said first jaw rotating around the first hinge and in relation to the second jaw kept stationary on the said support.

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**4,298,422**

## LABELLING MACHINE

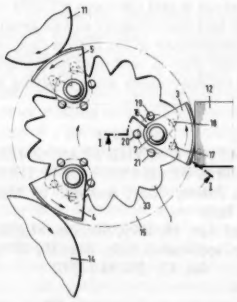
**Rudolf Zodrow, Dusseldorf, Fed. Rep. of Germany, ass'gnor to Jagenberg-Werke AG, Dusseldorf, Fed. Rep. of Germany**

**Continuation of Ser. No. 81,899, Oct. 4, 1979, abandoned. This application May 5, 1980, Ser. No. 146,397**

**Claims priority, application Fed. Rep. of Germany, Oct. 6, 1978, 2843602; Jan. 18, 1979, 2901853; Sep. 1, 1979, 2935433**

**Int. Cl.[3] B65C** *9/16*

**U.S. Cl. 156—568** **31 Claims**



1. In a labelling machine having a frame, a track, and a sequence of stations along said track, said stations including an adhesive-application station, a label-storage station and a label transfer station;

a rotatable carrier disposed within said track;

at least one label selector component mounted on said carrier for rotating in an opposite direction from said carrier, said selector component having an outwardly curved surface for rolling on an adhesive-application roll at said adhesive-application station, for picking-up a label at said label-storage station and for applying the label to said label transfer station; and

a planetary drive for rotating said selector component on said carrier, said drive including an internally-toothed sun wheel fixed in said frame and defining a lantern gearing thereon, a drive shaft secured to said selector component and a planetary gear driving said shaft and having a plurality of lanterns carried thereon for meshing with said lantern gearing on said sun wheel, said lantern gearing having teeth at each said station with flanks sloped according to the required acceleration and deceleration of rotation of said selector component for a rolling movement at each said station.

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**4,298,423**

## METHOD OF PURIFYING SILICON

**Joseph Lindmayer, Bethesda, Md., assignor to Semix Incorporated, Gaithersburg, Md.**

**Continuation-in-part of Ser. No. 751,343, Dec. 16, 1976, abandoned. This application Jan. 15, 1980, Ser. No. 112,213**

**Int. Cl.[3] C01B** *33/02*

**U.S. Cl. 156—616 R** **9 Claims**

1. A method of treating silicon having a percentage of impurities therein of at least 0.5%, thereby economically improving the purity thereof so that the resulting silicon will be of photovoltaic grade but less than semiconductor grade purity, comprising

(a) placing a charge of impure silicon having at least 0.5% impurities in a container that remains inert at a temperature at which silicon is in a freely molten state,

(b) heating said impure silicon in said container to a temperature at which all of said charge has melted and there is no liquid-solid interface between melted and unmelted silicon and impurities rise to the surface of the silicon, but not to a temperature at which the inert container will substantially react with the silicon,

(c) providing a non-oxidizing gaseous atmosphere at the surface of the molten silicon, said atmosphere being substantially free of water vapor and any other gas with which the silicon will react,

(d) causing a flow of said gaseous atmosphere over the surface of the molten silicon so that impurities at the surface of the molten silicon are carried away from said surface by said atmosphere, and

(e) thereafter cooling said silicon from its molten state to a temperature below its solidification point to form a solid silicon having a degree of purity greater than 99.5% but less than semiconductor grade silicon and suitable for use as a host material in photovoltaic cells.

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**4,298,424**

## METHOD FOR ETCHING POLYAMIDE SHAPED ARTICLES

**Sachio Terada; Akito Suhara; Toshiro Shimada, all of Ube; Takashi Nakamura, Onoda; Kunizo Hujii, Ube, and Nobuichi Nakahira, Nagoya, all of Japan, assignors to VBE Industries, Ltd., Yamaguchi, Japan**

**Filed Jun. 19, 1980, Ser. No. 160,856**

**Int. Cl.[3] B29C** *17/08*

**U.S. Cl. 156—668** **5 Claims**

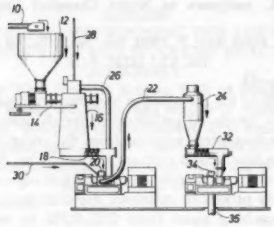
1. A method for etching polyamide shaped articles, which comprises etching a shaped article, which is obtained by shaping a composition comprising 100 parts by weight of a polyamide and 10 to 50 parts by weight of an inorganic filler, with an aqueous solution of borofluoric acid.

4,298,425

## METHOD AND APPARATUS FOR REFINING LIGNOCELLULOSE-CONTAINING MATERIAL TO PRODUCE FIBER PULP

Carl-Olov B. Ranzen, Bromma, and Knut O. Danielsson, Stockholm, both of Sweden, assignors to Defibrator Aktiebolag, Stockholm, Sweden

Filed Apr. 25, 1979, Ser. No. 33,119
Claims priority, application Sweden, May 3, 1978, 78051331
Int. Cl.[3] D21D 1/30
U.S. Cl. 162—18 7 Claims



1. In the method of producing pulp from lignocellulosic fibrous material in which the material is first subjected to a grinding operation in a steam pressurized defibrating apparatus of the rotating disc type and the resultant mass of separated fibers is blown by the accompanying steam into a steam separator where the steam is separated from the fiber mass to form a cottony wadding-like fiber mass suspended in a gaseous atmosphere and passed to a refiner of the rotating-disc type via a screw conveyor means rotating within a housing, the improvement enhancing the freeness and wet strength characteristics of the pulp, comprising:

compacting said cottony wadding-like fiber mass during its passage through said housing by compressing it by said screw conveyor means to a ratio between 1:2 and 1:6 so as to permit steam generated between the discs of said refiner to escape through said conveyor means housing without interfering with the constant supply of fiber mass to the refiner and to permit the refining to be performed at a dry content of about 25–30%.

3. In an apparatus for producing pulp from lignocellulosic fibrous material in which the material is first ground in a steam pressurized defibrator and the resultant mass of separated fibers blown by the accompanying steam into a steam separator where the steam is separated from the mass of separated fibers in the form of a cottony wadding-like fiber mass suspended in a gaseous atmosphere and passed to a further refiner of the rotating-disc type via a screw conveyor means rotating within a housing, the improvement comprising:

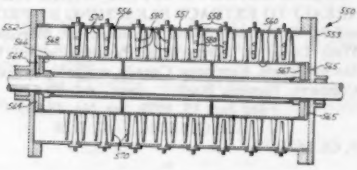
a screw conveyor means provided with screw flights calibrated relative to the housing so as to compress the cottony wadding-like fiber mass at a ratio between 1:2 and 1:6 during its passage through the housing so as to permit steam generated between the discs of said refiner to escape into said conveyor means housing without interfering with the constant supply of fiber mass to the refiner and means to permit the refining to be performed at a dry content of about 25–30%.

4,298,426

## METHOD AND APPARATUS FOR TREATING PULP WITH OXYGEN IN A MULTI-STAGE BLEACHING SEQUENCE

Louis O. Torregrossa, Puyallup; Jozef M. Bentvelzen, Sumner; Gerald D. Crosby, Seattle; Michael D. Meredith, Federal Way, all of Wash., and Henry Bepple, Kamloops, Canada, assignors to Weyerhaeuser Company, Tacoma, Wash.

Filed Jun. 15, 1979, Ser. No. 48,936
Int. Cl.[3] D21C 9/12, 9/14, 9/16; D21D 5/28
U.S. Cl. 162—57 79 Claims



1. The process of bleaching pulp comprising

treating pulp at a consistency of 7 to 15% with oxygen at an alkaline pH and a temperature of around 65° C. to around 121° C.,

washing said oxygen treated pulp,

treating said washed pulp with a bleaching chemical selected from a group consisting of chlorine, chlorine dioxide, combinations of chlorine and chlorine dioxide, hypochlorites, peroxides and ozone,

washing said bleaching chemical treated pulp, and

treating said latter washed pulp at a consistency of 7 to 15% with oxygen at an alkaline pH and a temperature of around 65° C. to around 121° C.,

said oxygen in each of said oxygen treatments being mixed with said pulp in a mixing zone in which a plurality of rotating members pass through said pulp in a direction transverse the direction of travel of said pulp,

said members having a major axis extending in the direction of rotation,

said members providing a swept area through said pulp of 10,000 to 1,000,000 square meters per metric ton of oven dry pulp,

said members having leading and trailing edges, said leading edge having a radius of curvature in the range of 0.5 to 15 mm.

41. A pulping apparatus comprising

first means for adding a pH adjustment chemical to pulp,

second means after said first means for adding oxygen to said pulp,

third means for mixing said oxygen with said pulp,

fourth means after said third means for washing said oxygen treated pulp,

fifth means after said fourth means for adding a chemical selected from the group consisting of chlorine, chlorine dioxide, a combination of chlorine and chlorine dioxide, hypochlorite, peroxide and ozone to said pulp,

sixth means for mixing said latter chemical with said pulp,

seventh means after said sixth means for washing said pulp,

eighth means after said seventh means for adding a pH adjustment chemical to said pulp,

ninth means after said eighth means for adding oxygen to said pulp,

tenth means for mixing said oxygen with said pulp,

eleventh means for transporting said pulp from said first through tenth means,

each of said oxygen mixing means having a mixing zone,

a plurality or rotors in said mixing zone,

said rotors having leading and trailing edges, said leading edge having a radius of curvature in the range of 0.5 to 15 mm,

said rotors having a major axis extending in the direction of rotation,
said rotors being rotatable through said pulp in a direction transverse to the direction of travel of said pulp,
means for rotating said rotors, and
said rotors providing a swept area of 10,000 to 1,000,000 square meters per metric ton of oven dry pulp.

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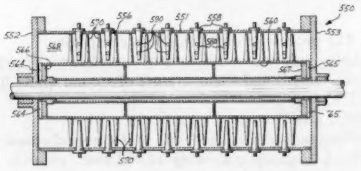
**4,298,427**

## METHOD AND APPARATUS FOR INTIMATELY MIXING OXYGEN AND PULP WHILE USING AN ALKALI TO EXTRACT BLEACHING BY-PRODUCTS

**Jozef M. Bentvelzen, Sumner; Michael D. Meredith, Federal Way; Louis O. Torregrossa, Puyallup, all of Wash., and Henry Bepple, Kamloops, Canada, assignors to Weyerhaeuser Company, Tacoma, Wash.**

**Filed Jun. 15, 1979, Ser. No. 48,947**
**Int. Cl.³ D21C** *9/10, 5/28*
**U.S. Cl. 162—57** **62 Claims**



1. The process of creating intimate contact between oxygen and pulp having a consistency of 8 to 15%, and treating said pulp with said oxygen while using an alkali to extract bleaching by-products from pulp, comprising
transporting said pulp to a storage tank,
storing said pulp in said tank for a time of ½ to 4 hours, and after said storage, washing extraction by-products from said pulp,
before said storage step: adding alkali to said pulp, said alkali being added in an amount in the range of ½ to 7%, expressed as sodium hydroxide, based on the oven dry weight of said pulp, and heating said pulp;
between said heating and said storage steps,
adding oxygen to said pulp, and
intimately mixing said oxygen with said pulp, said mixing occurring in a mixing zone in which a plurality of rotating members pass through said pulp in a direction transverse the direction of travel of said pulp,
said members having a major axis extending in the direction of rotation,
said members providing a swept area through said pulp of 10,000 to 1,000,000 square meters per metric ton of oven dry pulp,
said members having leading and trailing edges, said leading edge having a radius of curvature in the range of 0.5 to 15 mm.

45. A pulp extraction stage comprising
means for adjusting the consistency of said pulp to 8 to 15%,
means for transporting said pulp from said consistency adjustment means to a storage tank,
said storage tank,
means, after said tank, for washing said pulp,
means, before said tank, for adding alkali to said pulp,
means, between said consistency adjustment means and said tank, for heating said pulp,
between said heating means and said storage tank,
means for adding oxygen to said pulp, and
means for mixing said oxygen with said pulp, said mixing means having a mixing zone,
a plurality or rotors in said mixing zone,
said rotors having leading and trailing edges, said leading edge having a radius of curvature in the range of 0.5 to 15 mm,
said rotors being rotatable through said pulp in a direction transverse to the direction of travel of said pulp,
said rotors having a major axis extending in the direction of rotation,
means for rotating said rotors, and
said rotors providing a swept area of from 10,000 to 1,000,000 square meters per metric ton of oven dry pulp.

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**4,298,428**

## USE OF ADDITIVES IN PULP BLEACHING PROCESSES TO PRESERVE PULP STRENGTH

**Michael D. Breslin, and David R. Cosper, both of Downers Grove, Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.**

**Filed Aug. 7, 1980, Ser. No. 176,230**
**Int. Cl.³ D21C** *3/18*
**U.S. Cl. 162—73** **6 Claims**

1. In a method for the alkaline bleaching of aqueous slurries of chemically produced cellulosic materials utilizing a hypochlorite bleaching agent selected from the group consisting of sodium hypochlorite and calcium hypochlorite, the improvement comprising maintaining in the alkaline aqueous slurry of the chemically produced cellulosic material during treatment with said bleaching agent from 0.01–0.5% by weight of an amine compound selected from the group consisting of: ethylamine, methoxypropylamine, monoethanolamine, n-butylamine, 3-aminopropanol, isopropylamine, ethylenediamine, aniline, 2 amino-2 methylpropanol, 2-aminopropanediol triethylenetetramine, 1,3-diaminopropane, diaminohydroxypropane, ethylenediamine, hexamethylenediamine, morpholine.

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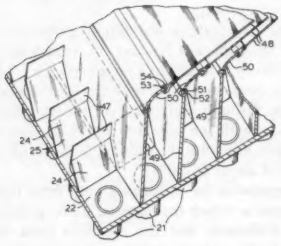
**4,298,429**

## MEANS FOR EFFECTING CROSS DIRECTION FIBER ORIENTATION IN A PAPERMAKING MACHINE HEADBOX

**Richard E. Hergert, Rockton, Ill., and Jan I. Bergstrom, Beloit, Wis., assignors to Beloit Corporation, Beloit, Wis.**

**Filed Sep. 17, 1979, Ser. No. 76,410**
**Int. Cl.³ D21F** *1/02, 1/06*
**U.S. Cl. 162—343** **11 Claims**



1. In a paper making machine headbox adapted for effecting cross machine direction fiber orientation in paper making stock flowing through the headbox, and including a slice chamber through which the stock flows in machine direction from a receiving end to a slice adapted to be associated with paper forming means, and stock delivering chamber means having an upsteam end adapted to communicate with a stock supply and a downstream end communicating with said receiving end of said slice chamber,
a set of spaced partitions which extend in oblique cross machine planes for defining passages dividing the paper making stock into a plurality of streams intermediate said upstream and downstream ends of said delivering chamber means for biasing the direction of flow of the flowing

paper making stock in cross machine direction for orienting stock fibers in the cross machine direction;

and flanges at the downstream ends of said partitions extending in substantially the machine direction for diverting the paper making stock from the downstream ends of said passages into substantially the machine direction to said receiving end of said slice chamber while permitting at least a substantial proportion of the fibers to remain in the cross machine direction orientation, so that at least a substantial proportion of the fibers will remain in the cross machine orientation during stock flow in said chamber to said slice and the cross machine oriented fibers will provide cross direction tensile strength in paper formed from said stock.

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**4,298,430**

## APPARATUS FOR DETERMINING THE LOCAL POWER GENERATION RATE IN A NUCLEAR REACTOR FUEL ASSEMBLY

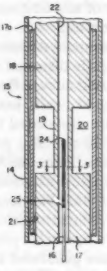
**Erik Rolstad; Thor-Harrald Korpas, both of Halden, Norway; Robert H. Leyse, Rockville, and Robert D. Smith, Bethesda, both of Md., assignors to Scandpower A/S, Kjeller, Norway**

**Filed Mar. 21, 1978, Ser. No. 888,881**

**Claims priority, application France, Mar. 23, 1977, 77 08657**

**Int. Cl.[2] G21C** *17/00*

**U.S. Cl. 376—247** **15 Claims**



2. A device for measuring local power generation rate within a nuclear reactor fuel assembly comprising:

(a) a cylindrical rod having a plurality of regions of substantially constant diameter, said rod being formed of heat conducting and electrically conducting material, said material being heated by any ambient gamma ray flux;

(b) said cylindrical rod having a central bore;

(c) said bore containing a plurality of differential thermocouples having cold and hot junctions;

(d) said rod being provided, between said regions of substantially constant diameter, with a plurality of zones of reduced diameter;

(e) a hot junction of one differential thermocouple being operatively positioned in said central bore midway of said zone of reduced thickness;

(f) the corresponding cold junction of said differential thermocouple being operatively positioned in said central bore between two successive zones of reduced thickness and spaced from the junctions between said two successive zones and the intervening region of substantially constant diameter;

(g) said cylindrical rod being secured in a relatively closely fitting shielding tube having an inner wall whereby an annular heat insulating chamber is defined by said zone of reduced diameter and the inner portion of said inner wall;

(h) whereby, when said cylindrical rod is heated by a longitudinal electric current or by an ambient gamma ray flux, the heat developed therein is rejected to the ambience; and

(i) whereby the heat conduction within said rod, in a zone of reduced diameter, is substantially in the axial direction and the heat conduction within said rod, in that portion of one of said regions of substantially constant diameter within which a cold junction is situated, is substantially in the radial direction.

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**4,298,431**

## DEVICE FOR THE THERMAL PROTECTION OF AN INTERNAL STRUCTURE OF A LIQUID METAL COOLED FAST REACTOR

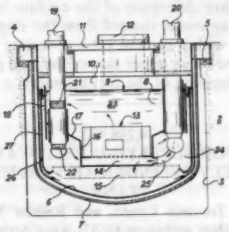
**Yves Depierre, Valensole; Jacques A. Figuet, Aix en Provence, and Guy Lemercier, Le Puy Sainte Reparade, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France**

**Filed Jun. 6, 1978, Ser. No. 913,110**

**Claims priority, application France, Jun. 13, 1977, 77 18031; May 12, 1978, 78 14195**

**Int. Cl.[3] G21C** *15/12, 13/02*

**U.S. Cl. 176—290** **11 Claims**



1. A thermal protection device for the thermal protection of a structure for a liquid-metal cooled nuclear reactor in which said structure comprises an outer vertical cylindrical wall and a coaxial cylindrical shell therein having at its upper end a free edge forming an overflow sill for said liquid metal, there being delimited between said wall and said shell a vertically-extending annular space through which is circulated in the upward direction a diverted flow of liquid metal withdrawn from a volume of said liquid metal in which a lower portion of said wall is immersed, wherein a surface of said cylindrical shell which is remote from said space has a packing of heat-insulating elements fixed on the entire periphery of said wall so that an over-flowing sheet of liquid metal which falls on the downstream side of said overflow sill passes through said packing before being returned into said volume of liquid metal, wherein the packing of heat-insulating elements is so disposed that a top face of the packing is located below the edges of the cylindrical shell which forms an overflow sill, said top face being covered by a distributor for distributing the flow of the liquid metal during overflow discharge, wherein a flow-distributing component is a perforated grid.

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**4,298,432**

## DEVICE FOR HOLDING GAS-COOLED FUEL ASSEMBLIES OF NUCLEAR REACTORS

**Theodor Hensolt, Nuremberg, Fed. Rep. of Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim an der Ruhr, Fed. Rep. of Germany**

**Filed Mar. 17, 1980, Ser. No. 130,607**

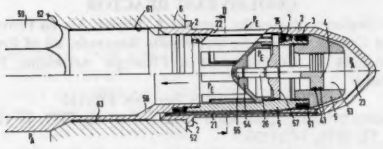
**Claims priority, application Fed. Rep. of Germany, Mar. 19, 1979, 2910690**

**Int. Cl.[3] G21C** *3/12*

**U.S. Cl. 376—365** **2 Claims**

1. Device for holding jacketed fuel assemblies of a gas-cooled nuclear reactor in a grid plate disposed beneath a reactor core and formed with cylindrical bores for receiving therein a respective fuel-assembly foot which serves simultaneously as a coolant inlet, comprising a tubular grid-plate insert member connected respectively to each of the bores for hydraulically holding down the respective fuel assemblies

against flow pressure of the coolant, said insert member being closed at the bottom thereof and having at least one lateral opening for passage of coolant to the respective fuel-assembly foot, piston rings peripherally disposed on the fuel-assembly foot above and below said lateral opening for sealing the foot with respect to the inner surface of said insert member, a plurality of wedge-like structural members uniformly distributed



about the periphery of the fuel-assembly foot above the lower of said piston rings, and a piston central to said foot and actuatable by a pressure difference of the coolant between an inlet thereof to and an outlet thereof from the respective fuel element, together with a conical yet non-sealing seat of the fuel assembly formed on an upper side of the grid plate, for effecting play-free clamping of the fuel assembly.

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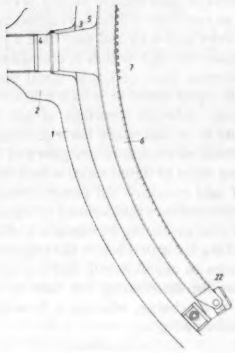
**4,298,433**

## MEANS FOR SUPPLYING FEED WATER TO A SUBSTANTIALLY CYLINDRICAL, VERTICAL REACTOR TANK

**Bo Kinnander; Torstein Landa, and Ragnar Mansson, all of Vesteras, Sweden, assignors to AB Asea Atom, Sweden**

**Filed Mar. 21, 1979, Ser. No. 22,547**
**Claims priority, application Sweden, Mar. 21, 1978, 7803213**
**Int. Cl.[3] G21C *15/00***
**U.S. Cl. 376—286** **9 Claims**



1. In a nuclear reactor having a substantially cylindrically-shaped and vertically extending pressure vessel and a feed-water distribution assembly for conveying and distributing feed-water within said pressure vessel, said pressure vessel having a vertically extending, substantially cylindrically-shaped wall having a feed-water nozzle extending therethrough, said feed-water nozzle having a cylindrical inner surface portion of a first diameter with an annular inner contact surface thereon of a second diameter greater than said first diameter, said feed-water distribution assembly

a hollow flow passageway assembly positioned within said pressure vessel and projecting into said feed-water nozzle extending through said cylindrically-shaped wall, said hollow flow passageway assembly including an outlet and an inlet, said flow passageway assembly inlet comprising a radially outwardly extending annular abutment portion having a diameter greater than the diameter of said inner surface portion of said feed-water nozzle, said inner surface portion being located upstream from said flow passageway assembly, whereby contact between said abutment portion and said contact surface provides a stop to limit insertion of said flow passageway assembly into said feed-water nozzle;

a curved, non-annular flow distributor assembly positioned within said pressure vessel and having an inlet attached to and in joint fluid-tight communication with said outlet of said flow passageway assembly, said flow distributor assembly further including a hollow passageway having a radially inner wall facing away from said flow passageway assembly and formed with a plurality of through apertures;

first and second bracket assemblies each fixedly attached to an inner surface of said cylindrically-shaped wall and circumferentially spaced from one another such that said first bracket assembly is positioned adjacent a first end portion of said curved flow distributor and said second bracket assembly is positioned adjacent a second end portion of said curved flow distributor;

each of said first and second bracket assemblies including a separate force transmitting member pivotally attached at one end portion to a respective bracket assembly with a resistance member adjustably mounted on an opposite end portion of said force transmitting member;

a separate attachment member surrounding each force transmitting member and each attachment member being pivotally attached to one of said first and second end portions of said flow distributor; and

separate spring means compressed between each attachment member and an adjacently disposed resistance member for automatically biasing said curved flow distributor towards said cylindrically-shaped wall, said resistance member having adjusting means associated therewith for initially compressing said spring means a predetermined amount with said predetermined amount being such that said attached flow passageway assembly projects into said feed-water nozzle and said abutment portion of said flow passageway assembly contacts said inner contact surface with a substantially constant pressure regardless of changes in fluid pressure generated by feed-water flowing through said feed-water distribution assembly.

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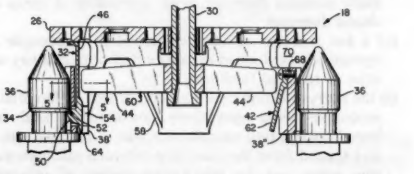
**4,298,434**

## BOTTOM MOUNTED FUEL HOLDDOWN MECHANISM

**Andrew J. Anthony, Tariffville, Conn., and Malcolm D. Groves, Clearwater, Fla., assignors to Combustion Engineering, Inc., Windsor, Conn.**

**Filed Nov. 13, 1978, Ser. No. 959,971**
**Int. Cl.[3] G21C *3/02***
**U.S. Cl. 376—364** **9 Claims**



1. A nuclear fuel assembly to be located below a core upper alignment plate and on a core support stand, the stand having projections thereon forming mating surfaces, comprising: a lower end fitting having an upper portion with an opening therethrough and a lower portion facing the support stand and including post means for placement adjacent to the projections; actuating means extending from the upper end of the assembly through the opening in the lower end fitting, and being movable relative thereto; and locking means carried by the lower end fitting adjacent to the post means and having a latch adapted to mate with the mating surface on the projec-

tions, the locking means being actuated by the movement of the actuating means, whereby the assembly may be selectively locked to the core support stand.

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4,298,435

## LIQUID SMOKE AND ITS PRODUCTION

Charles D. Ledford, Crossville, Tenn., assignor to The Baltimore Spice Company, Baltimore, Md.

Filed May 8, 1980, Ser. No. 147,989
Int. Cl.[3] A23B 4/04
U.S. Cl. 201—8 9 Claims

1. In a process for producing liquid smoke from hardwoods wherein the wood is pyrolyzed and the smoke product is absorbed in an aqueous solution, the improvements which comprise:

separating all pieces coarser than ¼ inch from a sawmill sawdust and recovering the wood fines from said separating step;

drying the wood fines to a moisture content below about 5% moisture by heating the same to a temperature no higher than 225° F.

calcining the dried wood below a temperature of 925° F. in the absence of any added air;

fractionating the wood smoke produced by said calcination by absorbing some of the smoke in an aqueous liquid and collecting the same and separately recovering the remainder of the smoke which is not absorbed in said liquid.

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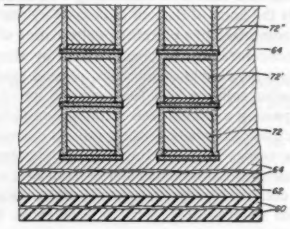
4,298,436

## METHOD OF FORMING INSULATED CONDUCTORS IN A CONDUCTIVE MEDIUM AND ARTICLE THUS FORMED

Lowell E. Thomas, Tewksbury, Mass., assignor to Dynamics Research Corporation, Wilmington, Mass.

Filed Jun. 11, 1980, Ser. No. 158,606
Int. Cl.[3] C25D 5/02, 5/10, 5/54
U.S. Cl. 204—15 18 Claims




1. A method for providing insulated conductive elements in a body of conductive material comprising the steps of:

providing a conductive substrate with oversized pads of dielectric material at positions over which the conductive elements are to be formed;

forming the conductive elements on the oversized pads, such that portions of the pads extend outwardly from the bottoms of the conductive elements;

coating the tops and sides of the conductive elements with dielectric material such that the dielectric material is sealed to the portions of the oversized pads extending from the bottoms of the conductive elements; and,

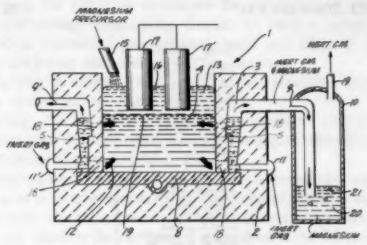
building up the substrate so as to at least surround the sides of said conductive elements.

4,298,437

## METHOD FOR PRODUCING MAGNESIUM METAL FROM MOLTEN SALT

Robert A. Hard, Laguna Beach, Calif., assignor to Occidental Research Corporation, Irvine, Calif.

Filed Jan. 25, 1980, Ser. No. 115,597
Int. Cl.[3] C25C 3/04
U.S. Cl. 204—70 18 Claims




1. A method for producing magnesium metal which comprises the steps of:

(a) providing a molten magnesium metal precursor,

(b) providing molten silicon alloy beneath the molten magnesium metal precursor in contact therewith, the density of the molten magnesium metal precursor being less than that of the molten alloy,

(c) applying an electric potential to the molten silicon alloy whereby it is cathodically energized,

(d) contacting the molten magnesium metal precursor with an anodically energized electrode,

(e) causing an electric current to flow between the anodically energized electrode and the cathodically energized molten silicon alloy sufficient to reduce said magnesium metal precursor whereby magnesium metal is liberated and deposited on the molten silicon alloy and dissolved therein, and

(f) vaporizing said dissolved magnesium metal by passing an inert gas through said molten silicon alloy containing magnesium metal dissolved therein at a temperature and rate whereby a substantially pure magnesium metal vapor is removed from said molten silicon alloy.

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4,298,438

## PREPARATION OF 4-TERT.-BUTYLBENZALDEHYDE

Dieter Degner, Dannstadt-Schauernheim; Hardo Siegel, Speyer, and Heinz Hannebaum, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

Filed Nov. 3, 1980, Ser. No. 203,597
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1979, 2948455
Int. Cl.[3] C25B 3/02
U.S. Cl. 204—78 4 Claims

1. A process for the preparation of 4-tert.-butylbenzaldehyde by electrochemical oxidation of 4-tert.-butyltoluene in the presence of an inorganic acid, wherein the oxidation is carried out in the presence of an alkylsulfonic, alkenylsulfonic or arylsulfonic acid.

**4,298,439**

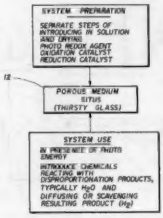
## PRODUCING LONG LIFE DISPROPORTIONATION PRODUCTS FROM A PHOTO REDOX AGENT USEFUL AS A REDUCING MEDIUM FOR WATER, AND THE LIKE

**Harry D. Gafney, Woodbury, N.Y., assignor to Research Foundation of the City University of New York, New York, N.Y.**

**Filed Aug. 11, 1980, Ser. No. 176,786**

**Int. Cl.³ B01J** *19/12;* **C01B** *3/08*

**U.S. Cl. 204—157.1 W** **24 Claims**


SYSTEM PREPARATION
SEPARATE STEPS OF INTRODUCING IN SOLUTION AND DRYING PHOTO REDOX AGENT OXIDATION CATALYST REDUCTION CATALYST
12
POROUS MEDIUM SITUS (THIRSTY GLASS)
SYSTEM USE
IN PRESENCE OF PHOTO ENERGY
INTRODUCE CHEMICALS REACTING WITH DISPROPORTIONATION PRODUCTS, TYPICALLY $H_2O$ AND DIFFUSING OR SCAVENGING RESULTING PRODUCT ($H_2$)

1. The method of disproportionately increasing the lifetime of photoinduced disproportionation products of a photo redox agent comprising the steps of,

introducing the photo redox agent into the pores of a transparent porous sorbent medium presenting an array of internal cavities, and

producing long life disporportionation products by transmission of photo energy into said medium to react with the photo redox agent situate in the pores of said medium.

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**4,298,440**

## METHOD AND APPARATUS FOR THE CORONA DISCHARGE TREATMENT OF WEBS, AND WEBS TREATED THEREWITH

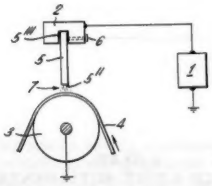
**John L. L. Hood, Taunton, England, assignor to British Cellophane Limited, Bridgwater, England**

**Filed Jan. 25, 1980, Ser. No. 115,395**

**Claims priority, application United Kingdom, Feb. 5, 1979, 3885/79**

**Int. Cl.³ H01T** *19/00*

**U.S. Cl. 204—165** **16 Claims**




1. Apparatus for the corona discharge treatment of a travelling web comprising means defining a gap wherein a corona discharge may be formed, and through which the travelling web may be drawn, a pair of spaced electrical conductors for supplying power for the discharge to the said gap defining means, and a power source for supplying an alternating electrical voltage across the conductors, the means defining the gap including an electrode member mounted in electrical contact to at least one of the conductors, the electrode member being formed from a dielectric material having a dielectric constant of from 80 to 750, and the conductors being sufficiently spaced apart to preclude an arc discharge therebetween.

**4,298,441**

## METHOD OF PRESERVING THE ELECTROPHORETIC PROPERTIES OF LIPOPROTEINS

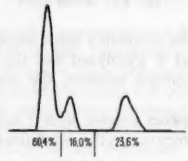
**Dietrich Seidel, Heidelberg; Heinrich Wieland, Waake, both of Fed. Rep. of Germany, and Ewald Molinari, Mödling, Austria, assignors to Immuno Aktiengesellschaft für chemisch-medizinische Produkte, Vienna, Austria**

**Filed Jun. 16, 1980, Ser. No. 159,672**

**Claims priority, application Austria, Jun. 27, 1979, 4484/79**

**Int. Cl.³ G01N** *27/26*

**U.S. Cl. 204—180 G** **6 Claims**




1. A method of preserving the electrophoretic properties of lipoproteins, in particular of LDL, VLDL and HDL lipoproteins, in human or animal plasma, plasma fractions or sera, in which the lipoprotein pattern is to be electrophoretically determined, which method comprises

adding non-reducing sugars to the plasma, plasma fractions or sera so as to obtain a mixture,

lyophilizing said mixture so as to obtain a lyophilizate, and reconstituting said lyophilizate prior to determination.

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**4,298,442**

## ELECTRODIALYSIS PROCESS FOR SILICA REMOVAL

**Anthony J. Giuffrida, North Andover, Mass., assignor to Ionics, Incorporated, Watertown, Mass.**

**Filed Aug. 4, 1980, Ser. No. 175,098**

**Int. Cl.³ B01D** *13/02*

**U.S. Cl. 204—180 P** **7 Claims**

1. An electrodialysis process for the removal of silica from aqueous solutions in an electrodialysis cell having a cathode chamber at one terminal end, an anode chamber at the opposite terminal end, said chambers containing a cathode and anode respectively the body of the cell as defined by the terminating electrodes comprised of a plurality of alternating silica diluting and silica concentrating-chambers defined by alternating cation and anion permeable membranes, passing said silica containing aqueous solution as a feed solution into said diluting chambers, passing a second feed solution into the concentrating and electrode chambers, passing a direct current across the terminal electrodes and withdrawing separate streams of deionized liquid and ion-enriched liquid from said cell; the improvement comprising adjusting the pH of the silica containing aqueous feed solution to a pH of at least above 9.5 prior to electrodialysis.

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**4,298,443**

## HIGH CAPACITY ETCHING APPARATUS AND METHOD

**Dan Maydan, Short Hills, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Continuation-in-part of Ser. No. 65,138, Aug. 9, 1979, abandoned. This application Dec. 20, 1979, Ser. No. 105,620**

**Int. Cl.³ C23C** *15/00*

**U.S. Cl. 204—192 E** **15 Claims**

1. In combination in an etching apparatus,

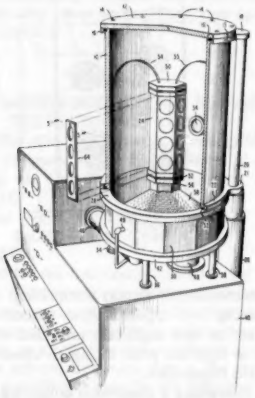
a conductive cylindrical chamber adapted to be connected to a point of reference potential,

a single multi-faceted cathode wafer holder centrally positioned within said chamber,

means for capacitively coupling said cathode wafer holder to a source of a-c power,

and means for establishing a gaseous atmosphere within said chamber at a specified pressure so that in response to a-c excitation of said apparatus a dark space is formed in the immediate vicinity of said holder and a plasma is formed between said dark space and the inner wall of said chamber.

**11.** A dry etching process for delineating fine-line patterns in multiple workpieces simultaneously by sputter etching or reactive sputter etching in a conductive cylindrical anode chamber adapted to be connected to a point of reference potential, said process comprising the steps of



mounting the workpieces on a single longitudinally extending cathode holder centrally positioned within said chamber,

establishing a predetermined gaseous atmosphere at a specified pressure within said chamber in the space between the holder and the inner wall of said chamber,

and capacitively coupling a-c power to said cathode holder to form a dark space in the immediate vicinity of said holder and to form a plasma between said dark space and the inner wall of said chamber to cause etching of said workpieces to occur.

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**4,298,444**

## METHOD FOR MULTILAYER THIN FILM DEPOSITION

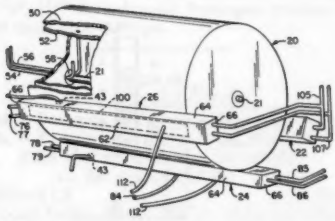
**Day Chahroudi, Berkeley, Calif., assignor to Heat Mirror Associates, Palo Alto, Calif.**

**Division of Ser. No. 950,356, Oct. 11, 1978, Pat. No. 4,204,942. This application Dec. 26, 1979, Ser. No. 106,595**

**The portion of the term of this patent subsequent to May 27, 1997, has been disclaimed.**

**Int. Cl.³ C23C *15/00***

**U.S. Cl. 204—192 R** **4 Claims**



**1.** A method for depositing thin films of at least a first and a second material onto an elongate substrate, said method comprising the steps of:

providing a vacuum chamber containing at least a first and a second means for depositing the first and second material;

separately housing the respective deposition means in enclosures each having terminal portions forming an edge that defines an opening;

transporting the substrate to and from the first and second deposition means;

supporting the substrate proximate the respective openings in confronting relationship thereto to form a generally uniform interstitial gap between each said edge of each said enclosure and said supporting means;

establishing an electric field between the respective deposition means and the supporting means;

sputtering the materials from the respective deposition means onto the supported substrate to deposit thin films of said materials on said substrate; and

introducing and maintaining gasses into the respective enclosures at pressures greater than the internal pressure of the chamber, the substrate being supported so that the interstital gap restricts the outflow of said gasses from the respective enclosures.

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**4,298,445**

## ANODE FOR CATHODIC PROTECTION SYSTEM

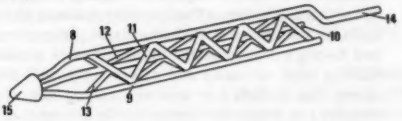
**Michael A. Warne, Brewood, England, assignor to Marston Excelsior Limited, Wolverhampton, England**

**Filed May 5, 1978, Ser. No. 903,036**

**Claims priority, application United Kingdom, May 9, 1977, 19384/77**

**Int. Cl.³ C23F *13/00***

**U.S. Cl. 204—196** **9 Claims**



**1.** An impressed current anode assembly for use in cathodic protection of underwater structures, said assembly comprising an elongate structure of at least three metallic rods secured in spaced, substantially parallel relationship by a plurality of rigid ties positioned at intervals along the length of the rods, the rods being so disposed that there are at least three planes each including the longitudinal axes of at least two rods, said rods being formed of a film forming metal selected from the group consisting of titanium, zirconium, niobium, hafnium, tantalum and film forming alloys and at least one of the rods having an anodically active material on its surface, said anodically active material being selected from the group consisting of platinum group metals and alloys and anodically active compounds thereof, the assembly being in use anodically connected at one end to a source of direct electric current, and the assembly being arranged to be supported in use at the said one end only.

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**4,298,446**

## APPARATUS FOR PLATING

**Masato Ando, Yokohama; Kenji Yamamoto, Komae, and Kazuhiro Taniguchi, Hiratsuka, all of Japan, assignors to Electroplating Engineers of Japan, Limited, Tokyo, Japan**

**Filed Apr. 18, 1980, Ser. No. 141,712**

**Claims priority, application Japan, Dec. 29, 1979, 54-172185**

**Int. Cl.³ C25D *17/02, 17/08***

**U.S. Cl. 204—224 R** **11 Claims**

**1.** An electroplating apparatus, comprising:

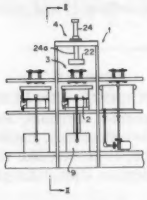
a plating tank having a first mask on the upper side thereof for engaging the lower surface of the object or objects to be plated, said first mask having opening means there-

through with said opening means having a configuration corresponding to the plating deposit to be made on the object or objects to be plated, nozzle means for jetting the plating liquid through said opening means and against said lower surface of the object or objects to be plated, said nozzle means being adapted to be connected as the anode of an electroplating circuit, said plating tank having positioning means on the upper side thereof;

a pair of elongated rails supported above said plating tank;

a support carriage, said support carriage comprising a carrier base supported on said rails for movement therealong and a rack base suspended from and supported on said carrier base for upward and downward movement with respect to said carriage base in directions away from and toward said plating tank, said rack base having holding means for holding the object or objects to be plated;

pressure means disposed above said rack base for moving said rack base downwardly and upwardly toward and away from said plating tank, said pressure means compris-



ing a pressure member having a second mask on its bottom, said second mask being adapted to contact the upper surface of the object or objects to be plated which are held in said holding means, a fluid pressure operated piston and cylinder assembly disposed above said pressure member and having a rod connected to said pressure member for moving same upwardly and downwardly, said pressure means also including a case surrounding said pressure member and connected thereto for limited relative vertical movement with respect thereto, said case having means engageable with said positioning means on said plating tank when said pressure means is in its lowermost position for positioning the said holding means and thereby the object or objects to be plated in proper position with respect to said first mask and said opening means therein, said pressure means having at least one lead wire extending along the lower surface of said second mask for contacting the upper surface of the object or objects to be plated, said lead wire being adapted to be connected as the cathode of said electroplating circuit.

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**4,298,447**

## CATHODE AND CELL FOR LOWERING HYDROGEN OVERVOLTAGE IN A CHLOR-AKALI CELL

**Terry M. Copeland, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed Mar. 7, 1980, Ser. No. 128,111**

**Int. Cl.³ C25B *11/04***

**U.S. Cl. 204—252** **11 Claims**

**1.** A cathode for use in electrolysis of an alkali metal halide comprising an electrically conductive cathode substrate and deposited particles consisting essentially of crystals of alpha-iron adherent to the surface of said cathode substrate.

**4,298,448**

## ELECTROPHORETIC DISPLAY

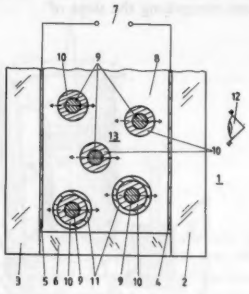
**Klaus Müller, Baden, and Andreas Zimmermann, Emmenbrücke, both of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland**

**Filed Jan. 24, 1980, Ser. No. 115,016**

**Claims priority, application Switzerland, Feb. 2, 1979, 1034/79**

**Int. Cl.³ C25D *1/12*; B03C *5/00***

**U.S. Cl. 204—299 R** **18 Claims**



**1.** An electrophoretic display comprising:

a cell having two opposed plates spaced relative to each other and at least regionally provided with electrodes of which at least the plate facing an observer and its electrode are transparent,

said cell containing a suspension consisting of an inert continuous dielectric liquid phase and a dispersed solid phase constituted at least in part by optically discriminable electrophoretic particles, said individual electrophoretic particles all having practically the same density as the liquid phase, and at least part of the electrophoretic particles constituted by pigment particles coated with a sheath of organic material solidified at the cell operating temperature but melting at higher temperatures,

wherein the sheath matrial contains at least one charge control agent so as to impart a well-defined and practically uniform surface charge as well as a well-defined and practically uniform surface potential to the electrophoretic particles.

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**4,298,449**

## SAMPLE TRAY FEEDING APPARATUS

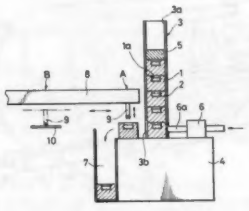
**Hideaki Ida, Musashimurayama, and Ryo Fujimori, Hachiouji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan**

**Filed Oct. 22, 1980, Ser. No. 199,638**

**Claims priority, application Japan, Oct. 26, 1979, 54-137739**

**Int. Cl.³ G01N *27/28***

**U.S. Cl. 204—299 R** **5 Claims**



**1.** A sample tray feeding apparatus comprising sample trays

each having plural number of cavities to be filled with samples, a sample tray accommodating container used for accommodating said sample trays in piled up condition and having at the lower end thereof a front opening and a rear opening each being of a size permitting to pass a single sample tray therethrough at a time, a sample tray protective cover to be mounted on the uppermost sample tray, a plural number of sample tray covers arranged movably in the vertical direction in a row at the back of the rear opening of said sample tray accommodating container and a shifting mechanism for displacing the lowermost sample tray, said sample tray feeding apparatus being adapted in such a manner that said shifting mechanism functions to displace the lowermost sample tray to a sample adhering position through the front opening of said sample tray accommodating container and then to the position under said sample tray cover through said rear opening after the sample application.

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**4,298,450**

## ALCOHOLS AS HYDROGEN-DONOR SOLVENTS FOR TREATMENT OF COAL

**David S. Ross, Palo Alto, and James E. Blessing, Menlo Park, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed Dec. 5, 1977, Ser. No. 857,717**
**Int. Cl.³ C10G *1/00, 1/06***
**U.S. Cl. 208—8 LE** **8 Claims**

1. In a method for the hydroconversion of coal by solvent treatment with a hydrogen-donor solvent under conditions to promote hydroconversion of the coal by hydrogen transfer activity, the improvement comprising utilizing as the hydrogen-donor solvent an alcohol having an α-hydrogen atom, and carrying out the solvent treatment step in the presence of a base capable of providing a catalytically effective amount of the corresponding alcoholate anion under the hydroconversion conditions.

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**4,298,451**

## TWO STAGE LIQUEFACTION OF COAL

**Martin B. Neuworth, Chevy Chase, Md., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed Feb. 25, 1980, Ser. No. 124,057**
**Int. Cl.³ C10G *1/00, 1/06;* B01J *1/00***
**U.S. Cl. 208—8 LE** **12 Claims**

1. A two stage process for converting solid, hydrogen-deficient, ash containing, hydrocarbonaceous material into liquid hydrocarbons which comprises

a. solvent extracting a solid, hydrogen deficient, ash containing hydrocarbonaceous material in the presence of hydrogen to produce a liquid extract product, said extraction being performed at a temperature in the range of about 600°–850° F., a coal feed throughput rate of 150–250 lbs/hr/ft³ and under hydrogen pressure in the range of about 1000 to 2000 psi;

b. solvent deashing to produce a clean extract; and

c. hydrocracking said clean extract in a catalytic ebullating bed hydrocracker to produce liquid hydrocarbons, said hydrocracking being performed at a temperature in the range of about 750°–825° F. and under hydrogen pressure in the range of about 2000–3000 psi.

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**4,298,452**

## COAL LIQUEFACTION

**Tansukhlal G. Dorawala, and Edwin R. Kerr, both of Wappingers Falls, N.Y., assignors to Texaco Inc., White Plains, N.Y.**

**Filed Mar. 28, 1980, Ser. No. 135,047**
**Int. Cl.³ C10G *1/00***
**U.S. Cl. 208—8 LE** **10 Claims**

1. A process for the liquefaction of a solid fuel which consists essentially of contacting a solid fuel in finely divided form in the presence of a solvent therefor with water and a material which can decompose to hydrogen and carbon monoxide at a temperature between about 700° and 900° F. and a pressure between about 0 and 400 psig for a period of time between about 1 minute and 120 minutes.

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**4,298,453**

## COAL CONVERSION

**Hans-Juergen Schoennagel, Lawrenceville, and John C. Zahner, Princeton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.**

**Filed Dec. 27, 1977, Ser. No. 864,402**
**Int. Cl.³ C10G *1/08, 1/00;* C10L *1/00;* C10J *3/16***
**U.S. Cl. 208—10** **25 Claims**

1. An improved coal conversion process comprising:

(a) combining finely divided particulate coal particles preheated to a temperature within the range of from about 100° to 600° F., finely divided solid cracking catalyst particles heated to a temperature within the range of from about 1300° to 1800° F.—the ratio of catalyst to coal being within the range from about 0.5:1 to 5:1, and a suspension-forming gaseous material whereby the coal particles are rapidly heated to a temperature within the range of from about 750° to 1650° F.;

(b) passing the suspension thus formed through a reactor arrangement providing a coal particle residence time within the range of from about 2 to 30 seconds;

(c) separating and recovering volatile products and gases from the solids following traverse of said reactor arrangement.

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**4,298,454**

## HYDROCONVERSION OF AN OIL-COAL MIXTURE

**Clyde L. Aldridge, and Roby Bearden, Jr., both of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Florham Park, N.J.**

**Continuation-in-part of Ser. No. 702,271, Jul. 2, 1976, abandoned. This application Oct. 11, 1979, Ser. No. 83,671**
**Int. Cl.³ C10G *1/06***
**U.S. Cl. 208—10** **23 Claims**

1. A process for simultaneously hydroconverting a non-hydrogen donor heavy hydrocarbon oil and coal in admixture, which comprises:

(a) forming a mixture of said heavy hydrocarbon oil, coal and an added thermally decomposable metal compound, in an amount ranging from about 10 to about 950 weight parts per million, calculated as the elemental metal, based on said oil-coal mixture, said metal being selected from the group consisting of Groups IVB, VB, VIB, VIIB and VIII of the Periodic Table of Elements and mixtures thereof;

(b) converting said thermally decomposable metal compound to a catalyst within said mixture in the presence of a hydrogen-containing gas by heating said mixture to an elevated temperature;

(c) reacting the resulting mixture containing said catalyst with hydrogen under oil and coal hydroconversion conditions, such that at least 50 weight percent of said heavy oil has a boiling point below the initial boiling point of said heavy oil, in a hydroconversion zone, said catalyst being the sole catalyst in said hydroconversion zone, and

(d) recovering a hydroconverted normally liquid hydrocarbon product.

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**4,298,455**

## VISCOSITY REDUCTION PROCESS

**Wann-Sheng Huang, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.**

**Filed Dec. 31, 1979, Ser. No. 108,751**
**Int. Cl.³ C10G *9/16, 9/00***
**U.S. Cl. 208—48 AA** **6 Claims**

1. A process for reducing the viscosity of a heavy hydrocarbon oil having an API gravity of less than about 15° while

inhibiting polymer formation which comprises subjecting said oil to a visbreaking treatment in the presence of a halogenated hydrocarbon free radical initiator present in an amount between 0.001 and 1.0% by weight and also in the presence of a chain transfer agent present in an amount between 0.1 and 5.0% by weight of the oil.

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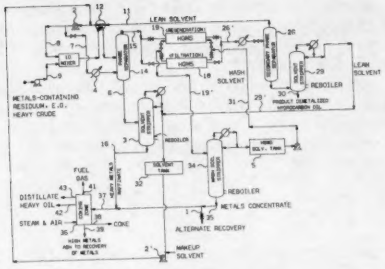
**4,298,456**

## OIL PURIFICATION BY DEASPHALTING AND MAGNETO-FILTRATION

**Daniel M. Coombs, and Dwight D. Boesiger, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.**

**Filed Jul. 22, 1980, Ser. No. 171,202**
**Int. Cl.³ C10G *32/02***
**U.S. Cl. 208—86** **16 Claims**




1. A process for demetallizing a heavy oil stream containing metals in the magnetizable form of paramagnetic molecules, paramagnetic particles or ferromagnetic particles or in the form of molecules/particles convertible to such a magnetizable form, comprising

(a) contacting the heavy oil stream with a light solvent stream to obtain an extraction mixture,

(b) separating said extraction mixture into an extract stream comprising solvent, extracted hydrocarbons and metals in the magnetizable form and into a residue stream having a high content of metals in the magnetizable form,

(c) subjecting said extract stream to a magneto-filtering step removing a significant amount of the metals in the magnetizable form from said extract stream and yielding a demetallized extract stream.

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**4,298,457**

## HYDROPYROLYSIS PROCESS FOR UPGRADING HEAVY OILS AND SOLIDS INTO LIGHT LIQUID PRODUCTS

**Alex G. Oblad; Joseph Shabtai, and Rasmasamy Ramakrishnan, all of Salt Lake City, Utah, assignors to University of Utah, Salt Lake City, Utah**

**Continuation of Ser. No. 941,840, Sep. 11, 1978, abandoned. This application Apr. 3, 1980, Ser. No. 137,083**
**Int. Cl.³ C10G *47/22***
**U.S. Cl. 208—107** **6 Claims**

1. A flow process for upgrading higher molecular weight, hydrocarbonaceous feedstocks into lower molecular weight, liquid, hydrocarbonaceous products in the absence of a highly turbulent flow comprising:

obtaining a higher molecular weight, hydrocarbonaceous feedstock;

pressurizing the feedstock under a hydrogen atmosphere within a hydrogen pressure range on the order of about 120 psi to 2250 psi; and

producing lower molecular weight, liquid products from the feedstock with minimal consumption of hydrogen and in the absence of a catalyst by heating the feedstock-hydrogen mixture to a temperature within the range on the order of about 450° C. to 650° C. while limiting process flow of the mixture to significantly less than a highly turbulent flow.

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**4,298,458**

## LOW PRESSURE HYDROTREATING OF RESIDUAL FRACTIONS

**Frederick Banta, Elmer; Donald Milstein, Cherry Hill, and Alan W. Peters, Morrestown, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.**

**Filed Feb. 25, 1980, Ser. No. 124,017**
**Int. Cl.³ C10G *47/12, 45/08***
**U.S. Cl. 208—112** **5 Claims**

1. In a process for hydrotreating of residual charge stock boiling above 650° F. to reduce sulfur, nitrogen and metal contaminants by contacting said charge stock and hydrogen with a fixed bed of a catalyst consisting essentially of a hydrogenation component supported on porous alumina at elevated temperature and pressure; the improvement for enhanced concurrent production of gasoline and distillate boiling below about 650° F. which comprises conducting said contacting at a high temperature of 850° to 950° F., a low pressure of 100 to 600 psig during a short contact period of high catalyst activity for production of gasoline and distillate at said conditions of temperature and pressure between about two hours and fifteen days, terminating said contacting at the end of said period, regenerating said catalyst by oxidation of combustible deposits thereon and again contacting the regenerated catalyst with said charge stock and hydrogen.

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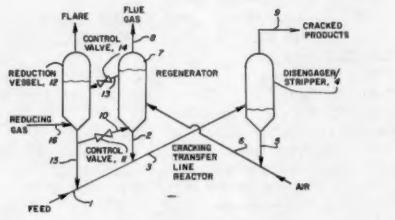
**4,298,459**

## FLUID CATALYTIC CRACKING OF HEAVY PETROLEUM FRACTIONS

**David F. Tatterson, and William D. Ford, both of Downers Grove, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.**

**Filed Nov. 5, 1979, Ser. No. 91,455**
**Int. Cl.³ C10G *11/05, 11/18***
**U.S. Cl. 208—120** **16 Claims**




1. A process for the fluid catalytic cracking of hydrocarbon feedstocks containing metallo-organic compounds wherein (i) coke deposits on the used cracking catalyst are reduced by regeneration from a range of from about 1.0 weight percent to about 5.0 weight percent to a range from about 0.01 weight percent to about 0.5 weight percent, (ii) metal deposits in the used cracking catalyst are deactivated in sufficient amounts by alternate exposures to oxidizing and reducing zones in cycles of up to 30 minutes in duration to reduce hydrogen and coke formation during said cracking, whereby the said catalyst is suitable for reuse, which process comprises:

(a) cracking said feedstock at a temperature from about 850° F. to about 1500° F. in a reaction zone in contact with fluidized solid particles, the said particles comprising a cracking catalyst;

(b) withdrawing said particles from said reaction zone;

(c) subjecting the said particles to said oxidizing zone wherein molecular oxygen in flue gas emitted from said

oxidizing zone is over 0.1 volume percent and temperature is in the range from about 900° F. to about 2200° F;

(d) withdrawing the said particles from said oxidizing zone;

(e) subjecting said particles to said reducing zone wherein a reducing atmosphere is present in a concentration from about 4 to 100 volume percent and temperature is in the range of from about 900° F. to about 1450° F.;

(f) recycling said particles to said oxidizing zone;

(g) withdrawing said particles from said reducing zone or said oxidizing zone wherein said particles are in a condition suitable for reuse in the said reaction zone.

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**4,298,460**

## PROCESS FOR PROCESSING SULFUR-CONTAINING HEAVY OIL

**Kuniaki Fujimori, Tokyo; Teruo Suzuka, Kawaguchi; Yukio Inoue, Urawa, and Shirou Aizawa, Toda, all of Japan, assignors to Nippon Mining Company, Limited, Tokyo, Japan**

**Filed Mar. 24, 1980, Ser. No. 133,082**

**Claims priority, application Japan, Mar. 22, 1979, 54-33670**

**Int. Cl.³ C10G** *11/02, 11/18*

**U.S. Cl. 208—121** **11 Claims**

1. A process for processing a sulfur-containing heavy oil, which comprises:

in a first zone, catalytically cracking a sulfur-containing heavy oil in a fluidized manner in the presence of reduced-state catalyst particles containing about 30 to 60 wt % Fe to thereby convert the heavy oil to a light oil, depositing sulfur-containing coke on the catalyst particles, and partially fixing the decomposed sulfur compounds with reduced iron contained in the catalyst particles as iron sulfide;

in a second zone, contacting the catalyst from the first zone with an oxygen containing gas in an amount less than that theoretically required to thereby partially combust the coke on the catalyst, reduce the iron in the catalyst, and fix the sulfur compounds contained in the coke as iron sulfide; and

in a third zone, contacting the reduced-state catalyst from the second zone with steam in a fluidized manner to produce hydrogen and hydrogen sulfide and to convert the reduced iron and iron sulfide in the catalyst to iron oxides, with the iron oxide-containing catalyst obtained in the third zone being recirculated into the second zone to be reduced and a part of the reduced-state catalyst obtained in the second zone being recirculated into the first zone.

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**4,298,461**

## CATALYST AND PROCESS

**Regis J. Pellet; Michael J. Gradassi, both of Wheaton, Ill., and Raiph J. Bertolacini, Chesterton, Ind., assignors to Standard Oil Company (Indiana), Chicago, Ill.**

**Filed Nov. 8, 1979, Ser. No. 92,569**

**Int. Cl.³ C10G** *35/06*

**U.S. Cl. 208—139** **8 Claims**

1. A process for reforming a hydrocarbon stream comprising naphtha which process comprises contacting said hydrocarbon stream under reforming conditions and in the presence of hydrogen with a hydrocarbon conversion catalyst comprising at least one platinum-group metal deposited on a composite comprising (1) alumina and (2) rhenium deposited on silica.

6. The process of claim 1 wherein said catalyst comprises about 0.2–0.7 wt. % rhenium and about 0.2–0.7 wt. % platinum, each being calculated as the element, about 15–25 wt. % silica, about 75–85 wt. % alumina and wherein said catalyst further comprises about 0.1–1 wt. % chlorine.

**4,298,462**

## HYDROCARBON DEHYDROCYCLIZATION WITH AN ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

**George J. Antos, Bartlett, Ill., assignor to UOP Inc., Des Plaines, Ill.**

**Continuation-in-part of Ser. No. 46,884, Jun. 8, 1979, Pat. No. 4,238,365, which is a division of Ser. No. 884,310, Mar. 7, 1978, Pat. No. 4,190,521. This application Nov. 17, 1980, Ser. No. 207,825**

**Int. Cl.³ C07C** *15/8;* **B01J** *27/08;* **C10G** *35/09*

**U.S. Cl. 208—139** **27 Claims**

1. A method for dehydrocyclizing a dehydrocyclizable hydrocarbon comprising contacting the hydrocarbon at hydrocarbon dehydrocyclization conditions with an acidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.05 to about 5 wt. % nickel, about 0.01 to about 5 wt. % zinc and about 0.1 to about 3.5 wt. % halogen; wherein the platinum group metal, catalytically available nickel and zinc components are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum group component is present in the elemental metallic state; and wherein substantially all of the catalytically available nickel component is present in the elemental metallic state or in a state which is reducible to the elemental metallic state under hydrocarbon dehydrocyclization conditions or in a mixture of these states.

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**4,298,463**

## METHOD OF TREATING A SOUR PETROLEUM DISTILLATE

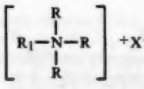
**Robert R. Frame, Glenview, Ill., assignor to UOP Inc., Des Plaines, Ill.**

**Filed Jul. 11, 1980, Ser. No. 167,630**

**Int. Cl.³ C10G** *19/00, 27/00, 29/00*

**U.S. Cl. 208—189** **13 Claims**

1. A method of treating a mercaptan-containing sour petroleum distillate which comprises contacting said distillate with an elemental oxygen-containing gas and a mercaptan oxidation catalyst in the presence of additive consisting essentially of both (1.) a substituted ammonium compound represented by the structural formula:



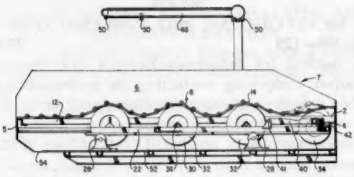
wherein R is a hydrocarbon radical containing up to 20 carbon atoms selected from the hydrocarbon radicals of alkyl, cycloalkyl, aryl, alkaryl and aralkyl, $R_1$ is a substantially straight chain alkyl radical containing from about 5 to about 20 carbon atoms, and X is an anion selected from the group consisting of halide, nitrate, nitrite, sulfate, phosphate, acetate, citrate, tartrate and hydroxide and (2.) an organic linear ionic compound having anionic and cationic constituents, the anionic constituent being a straight chain unbranched hydrocarbon moiety having from about 9 to about 24 carbon atoms in said chain and a moiety selected from the group consisting of a sulfonate, sulfate and carboxylate moiety, the cationic constituent selected from the group consisting of an alkai metal and ammonium, wherein the weight ratio of said organic linear ionic compound and said substituted ammonium compound is from about 1:20 to about 1:1 to oxidize said mercaptans in said sour petroleum distillate.

**4,298,464**

## ROCK SEPARATOR

**Klaus Djukastein, Sidney, Canada, assignor to Deroker Equipment Ltd., Sidney, Canada**

**Filed May 2, 1980, Ser. No. 146,004**
**Int. Cl.³ B07B *1/28***
**U.S. Cl. 209—310** **10 Claims**



1. A rock separator of the type intended to be elevated at one end during use in placer mining comprising:

a frame having sides and front and back ends, a material entrance being provided at the front end of the frame;

a screen extending from side to side and front to back of the frame and supported within the frame, the end of the screen at the elevated end of the separator being secured to the frame, the screen comprising a plurality of rigid plates laterally extending across the frame, the plates being hinged to adjacent plates and spaced therefrom a pre-determined distance;

a carriage situated beneath the screen and means for longitudinally reciprocating said carriage with respect to the frame;

screen distortion means comprising a plurality of spaced rows of rounded projections mounted on the carriage, these projections bearing against the bottom surface of the screen whereby, during operation, they move back and forth beneath the hinged plates to create a wave action on the screen to move material across the screen from front to back;

receptacle means under the screen and screen distortion means to collect material falling through the spaces between the plates of the screen.

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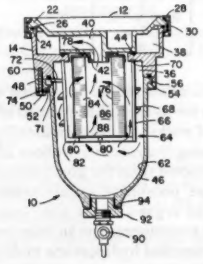
**4,298,465**

## FUEL FILTER AND WATER SEPARATOR APPARATUS

**James B. Druffel, Modesto, Calif., assignor to Racor Industries, Inc., Modesto, Calif.**

**Filed Jun. 7, 1979, Ser. No. 46,384**
**Int. Cl.³ B01D *29/40***
**U.S. Cl. 210—304** **2 Claims**



1. A fuel filter apparatus for filtering and separating low density fluid from higher density fluid and particles, which filter apparatus is operable in a variety of engines, comprising:

a bowl defining an internal fluid separation chamber;

a bracket means for mounting said bowl to the engine;

base means separate from said bracket means for defining a fluid inlet passage having an inlet port adapted to be communicable with the engine fuel line and for defining a fluid outlet passage having an outlet port adapted to be communicable with the engine fuel line, said inlet and outlet passages provided in fluid communication with said internal fluid separation chamber;

said base means including a filter element, a removable lid and clamp means for securing the removable lid to the remainder of said base means and wherein said fluid outlet passage defines a nipple means for removably mounting said filter element, which nipple means is integral with said removable lid to allow removal and inspection of said filter element with the removal of said removable lid and wherein said filter element extends into said internal fluid separation chamber;

a sleeve positioned about said filter element in said internal fluid separation chamber and spaced from said bowl, and wherein said inlet port communicates with the space between said sleeve and said bowl;

a spiral fluid flow director flange secured to the outer surface of said sleeve and extending substantially continuously, axially along said sleeve, said flow director flange for spirally directing the fluids in the space between the sleeve and the bowl so that the particles and higher density fluids seek a spiral orbit with a larger diameter than the spiral orbit of the low density fluid; and

wherein said spiral fluid flow director flange is spaced from said bowl so that particles and higher density fluids in the larger diameter orbit can flow downwardly past said spiral fluid flow director flange in the space between said bowl and said spiral fluid flow director flange;

means for selectively positioning in a plurality of positions said inlet port and said outlet port relative to said bracket means including:

a first plurality of apertures provided through said bracket means which first plurality of apertures are located in a circle having a predetermined radius;

another plurality of apertures provided through said base means, which another plurality of apertures are located on another circle having said predetermined radius and are selectively alignable with said first plurality of apertures; and

means disposable through said first plurality of apertures and said another plurality of apertures, with said first plurality of apertures and said another plurality of apertures aligned, for securing said bracket means to said base means with said base means positioned in any one of a plurality of orientations with respect to said bracket means to allow selective positioning of said inlet and outlet ports relative to said bracket means.

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**4,298,466**

## APPARATUS AND METHOD FOR VISUALLY MONITORING AN ION EXCHANGE FLUIDIZED BED

**Donald P. Satchell, Jr., Clifton, Ariz., assignor to Phelps Dodge Corporation, New York, N.Y.**

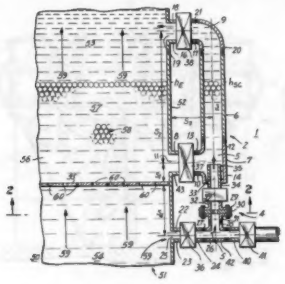
**Filed Jan. 10, 1980, Ser. No. 110,839**
**Int. Cl.³ B01D *35/14;* B01J *8/20***
**U.S. Cl. 210—94** **10 Claims**

1. Apparatus for monitoring a fluidized bed in a resin ion exchanger, the exchanger having a chamber and a source of process solution connected to the chamber, the chamber containing the fluidized bed which includes preferentially absorbing resin and process solution supplied to the chamber from the source, the apparatus comprising:

(a) a sample column having a wall at least a portion of which is transparent, a resin transfer conduit adapted to be connected to the exchanger to fluidly couple the column to the exchanger fluidized bed for enabling resin transfer between the exchanger and sample column fluidized bed, a solution sample inlet for receiving a process solution sample for supply to the column, and a solution sample outlet conduit adapted to be connected to the exchanger

to fluidly couple the column to the exchanger for enabling return of the solution sample to the exchanger after the solution sample has passed through the column such that a sample fluidized bed is established in the column, at least a portion of which is visible; and

(b) a regulator having an inlet conduit adapted to be connected to the exchanger to fluidly couple the regulator to the exchanger process solution source to divert a quantity of process solution before it enters the exchanger fluidized



bed for establishing the process solution sample, an orifice in fluid communication with the regulator inlet conduit for regulating the solution sample flow rate, and a regulator outlet conduit connected to the sample column inlet to fluidly couple the regulator orifice to the sample column for supplying the process solution sample at a controlled flow rate to the sample column such that the sample column fluidized bed height is visually monitorable and representative of the exchanger fluidized bed height.

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**4,298,467**

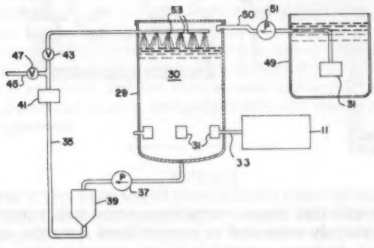
## WATER TREATMENT SYSTEM

**William J. Gartner, Bartlett, and Ha.ry R. Henke, Northbrook, both of Ill., assignors to Panlmatic Company, Elk Grove Village, Ill.**

**Continuation of Ser. No. 803,577, Jun. 6, 1977, abandoned. This application Jun. 5, 1980, Ser. No. 156,810**

**Int. Cl.³ C02F *1/50, 1/78***

**U.S. Cl. 210—96.1** **7 Claims**



1. A continuous system for the treatment of water effluent containing such impurities as phenols, cyanides and heavy metals, said system comprising:

a vented flow control tank containing said water;

a supply conduit connecting said flow control tank to an existing source of said water;

a vented reaction tank in communication with said flow control tank containing said water, said reaction tank having a first dispenser means adapted therewith containing alkaline material, said alkaline material being added to said water to increase the pH of said water to a range of from 10 to 12;

a constant flow pump disposed within said system for continuous circulation of said water therethrough;

a vented treatment tank communicating with said reaction tank formed with upper and lower baffle plates;

ozone generating means;

diffusion means mounted near the base of said treatment tank;

an ozone line connecting said ozone generating means with said diffusion means for the dispersion of ozone throughout said water in said treatment tank for the treatment of said impurities by said ozone, said treatment of said impurities producing reacted end products including metal ions and oxides, said reacted end products being partially removed from said water by contacting said baffle plates within said treatment tank;

outlet m[illegible]s connected to said treatment tank for continuous flow of said water therefrom;

means communicating with said outlet means for the removal of said reacted end products remaining in said water; and,

second dispenser means connected to said outlet means containing acidic material having a low pH, said acidic material being added to said water to lower the pH to a range of from 6 to 8, whereby reaction of said impurities with said ozone and removal of said reacted end products produces treated water substantially free of said impurities.

5. A batch water treatment system for the removal of impurities from water to form treated water comprising:

a reaction tank;

a supply tank containing water to be treated;

a supply conduit connecting said supply tank with said reaction tank;

first pump means disposed along said supply conduit for pumping said water to be treated from said supply tank to said reaction tank for treatment;

first diffusion means disposed about the circumference of said reaction tank near the bottom;

ozone generating means communicating with said first diffusion means for bubbling ozone throughout said water in said reaction tank for treatment of said impurities contained in said water producing reacted end products of said impurities;

a circulation conduit connecting at one end near the bottom of said raction tank and extending at the other end into the interior of said reaction tank near the top for continuous circulation of said water through said reaction tank during the treatment of said impurities in said water, said circulation conduit including second diffusion means disposed within said reaction tank for reducing foaming at the surface of said water and to recapture excess ozone during said treatment;

third diffusion means disposed along said supply conduit within said supply tank, said supply conduit capturing excess ozone escaping from the water within said reaction tank and conveying said ozone to said third diffusion means within said supply tank for preliminary treatment of said water;

filter means connected along said circulation conduit for the removal of said reacted end products of said impurities from said water forming treated water;

drain means connected to said circulation conduit for removal of said treated water from said system once said impurities are removed;

monitoring means communicating with said circulation conduit for detecting the level of impurities in said water as said treatment progresses, said monitoring means activating said drain means when said impurities are removed to completely drain said treated water from said reaction tank, whereupon said monitoring means activates said first pump means to transfer water to be treated from said supply tank to said reaction tank for treatment, said monitoring means closing said drain means and deactivating

said first pump means when said reaction tank fills to repeat said treatment process.

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**4,298,468**

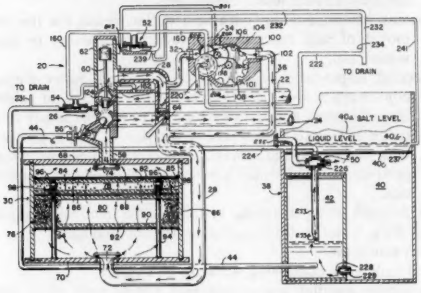
## FLUID TREATING APPARATUS

**Don E. Heskett, 1 S. 336 Euclid Ave., Villa Park, Ill. 60181**

**Continuation of Ser. No. 937,056, Aug. 28, 1978, abandoned, which is a continuation of Ser. No. 844,437, Oct. 21, 1977, abandoned, which is a continuation of Ser. No. 659,214, Feb. 19, 1976, abandoned, which is a division of Ser. No. 370,235, Jun. 15, 1973, Pat. No. 3,960,721. This application Apr. 21, 1980, Ser. No. 142,113**

**Int. Cl.³ B01J** *49/00*

**U.S. Cl. 210—136** **2 Claims**




1. An apparatus for supplying a regenerant fluid to an ion exchange resin bed, said apparatus comprising: a regenerant metering and supply tank having one end thereof selectively communicable to a fluid source under line pressure and the other end thereof operatively connected to a supply line communicating with an ion exchange resin bed, said regenerant metering and supply tank being adapted to contain a supply of regenerant fluid; control means for selectively communicating said fluid source under line pressure to said regenerant metering and supply tank for selectively charging said line pressure to said one end of said regenerant metering and supply tank for displacing the contents thereof and supplying said regenerant fluid to said ion exchange resin bed by the passage thereof through said supply line; and, means for replenishing the supply of regenerant in said regenerant metering and supply tank, said replenishing means including a regenerant storage tank, conduit means communicating the interior of said storage tank with said regenerant metering and supply tank, and a flow control valve constructed and arranged to prevent flow from said regenerant metering and supply tank to said storage tank and to provide flow from said storage tank through said conduit means to said regenerant metering and supply tank when said regenerant metering and supply tank is not charged with said line pressure.

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**4,298,469**

## MANIFOLDING SYSTEM FOR OIL PURIFIERS

**Ralph W. LeBlanc, and Robert M. Bingham, both of P.O. Box 52734, New Orleans, La. 70152**

**Filed Jul. 14, 1980, Ser. No. 167,778**

**Int. Cl.³ B01D** *25/30*

**U.S. Cl. 210—168** **5 Claims**

1. An apparatus for use with a plurality of oil refiners and contaminated oil from an oil utilizing source; said apparatus comprising:

(a) a supporting manifold adapted for supplying contaminated oil to and removing uncontaminated oil from the refiners and being independent therefrom;

(b) said supporting manifold including:

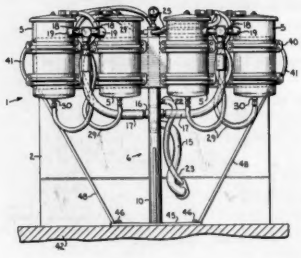
(1) a first flow chamber for receiving the contaminated oil;

(2) first connecting means for flow interconnecting said first flow chamber with each of the refiners;

(3) a second flow chamber adapted for flow communicating with the engine for transferring refined oil thereto after the refined oil has passed through the refiner; and

(4) second connecting means for flow interconnecting each of the refiners with said second flow chamber; and

(c) securing means for connecting each of the refiners to said manifold system; and wherein:



(d) said manifold comprises a tubular member being intermediately partitioned normal to an axis thereof so as to define first and second chambered portions therein; said first and second chambered portions comprising said first chamber and said second chamber respectively; and wherein

(e) each of said first and second chambered portions are adapted to be interconnected with the oil utilizing source by a single conduit respectively.

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**4,298,470**

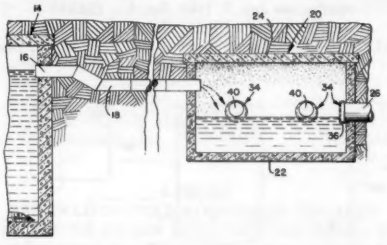
## SEWAGE SEPTIC SYSTEM WITH LIQUID FLOW DRAINAGE CONTROL

**Billy G. Stallings, 3 Crescent Dr., Kinston, N.C. 28501**

**Filed May 22, 1980, Ser. No. 152,395**

**Int. Cl.³ E03F** *11/00*

**U.S. Cl. 210—170** **4 Claims**



1. A septic tank system comprising a septic tank, a junction box operatively connected to receive liquid from the septic tank, and discharge means operatively connected into said junction box for discharging liquid from the junction box into a septic drain field, said discharge means including an open ended pipe having an end extending into said junction box to receive and discharge liquid therefrom, a cap member mounted on said end being located in said junction box, said cap member including an end closure face having an opening eccentrically offset from the axial center of the pipe and a flange extending from said end clousre face, said flange having an internal dimension for rotatably securing the cap to the open ended pipe, said cap member being rotatably secured to the pipe to variably position said opening with respect to the surface level of a liquid in said junction box, thereby controlling the liquid discharge flow into the drain field.

**4,298,471**

## APPARATUS FOR EQUALIZATION OF OVERFLOW WATER AND URBAN RUNOFF IN RECEIVING BODIES OF WATER

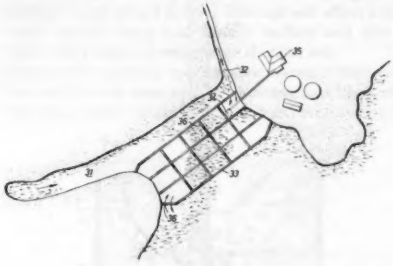
**Karl R. Dunkers, Hästskovägen 7, S-183 50 Täby, Sweden**

**Continuation of Ser. No. 10,929, Feb. 9, 1979, abandoned. This application Sep. 10, 1980, Ser. No. 185,684**

**Claims priority, application Sweden, Mar. 2, 1978, 7802392**

**Int. Cl.³ C02F *1/00*; E02B *13/00***

**U.S. Cl. 210—170** **4 Claims**



**1**. An apparatus for equalizing the flow of polluted water comprising a tank including a plurality of sequentially fluid connected compartments arranged in a body of water, a first compartment of said plurality being in communication with an inlet discharging polluted water at a variable rate of flow, and a last compartment of said plurality being in fluid communication with said body of water surrounding said tank such that water may flow either from said last compartment to said surrounding body of water or from said surrounding body of water into said last compartment, said tank being formed with generally vertical outer and intermediate walls, extending from the surface of said body of water to its bottom, which divide said tank into said plurality of compartments, said plurality of compartments being sequentially fluid connected by apertures provided in said intermediate walls and permitting fluid flow in both directions, a pump provided in said first compartment adjacent to the inlet for polluted water and connected to an outlet conduit for withdrawing water from said first compartment at a substantially constant rate of flow, whereby when the rate of discharge of said polluted water into said first compartment exceeds the rate of withdrawal of water by said pump, polluted water will sequentially displace water present in said compartments in a direction toward said surrounding body of water, while when the rate of discharge of polluted water into said first compartment is lower than the rate of withdrawal of water by said pump, water from said surrounding body of water will enter said last compartment and sequentially displace polluted water in the opposite direction toward said first compartment.

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**4,298,472**

## PROCESS FOR MANUFACTURING IMPREGNATED SILICAS AND THE USE OF THESE SILICAS FOR ANALYSIS OR PURIFICATION OF INDUSTRIAL PRODUCTS

**Jean-Pierre Durand, La Celle St Cloud, and Nicole Petroff, Jouy en Josas, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France**

**Filed Mar. 13, 1980, Ser. No. 129,956**

**Claims priority, application France, Mar. 13, 1979, 79 06383**

**Int. Cl.³ C02F *1/68*; B01J *31/02*; C07C *7/12***

**U.S. Cl. 210—198.2** **17 Claims**

**1**. A process for manufacturing an adsorbent composition comprising impregnated silica, which comprises passing a substantially anhydrous solution of a polar organic compound in a non-polar organic diluent through a bed of substantially anhydrous silica particles, under an input pressure of at least 200 bars absolute, and the amount of said solution passed being sufficient for modifying the adsorbent properties of the silica particles by providing said silica particles with the selective properties of said polar organic compound, without substantially impairing the absorbing efficiency of said silica particles.

**16**. The use of a column packed with an impregnated silica as obtained by the process of claim **1** to separate the constituents of a mixture of organic compounds comprising passing the mixture of organic compounds through the column at a relatively low pressure as compared to the pressure used to impregnate the silica.

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**4,298,473**

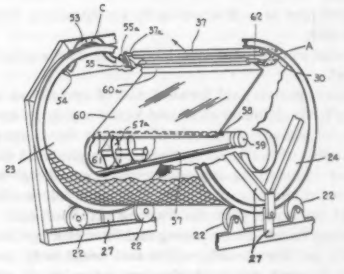
## DRUM FILTER APPARATUS

**Floyd H. Wyman, Mauldin, S.C., assignor to Marshall and Williams Company, Greenville, S.C.**

**Continuation-in-part of Ser. No. 923,706, Jul. 11, 1978, Pat. No. 4,224,166. This application May 16, 1980, Ser. No. 150,323**

**Int. Cl.³ B01D *33/10***

**U.S. Cl. 210—213** **8 Claims**



**1**. A liquid filter having a cylindrical horizontally disposed perforate drum for retaining solids therein while permitting filtered liquid to flow therethrough, having means supporting the drum for rotation about a horizontal axis, comprising:

a head member carried within said perforate drum at each end thereof stationary with respect to said perforate drum which rotates thereabout;

a driven conveyor carried adjacent the top of and extending substantially the entire length of said drum above the horizontal axis;

means removing solids retained within said drum and depos-

iting them adjacent the top thereof by gravity onto said conveyor for removal through a head member above said horizontal axis:

a distribution pipe carrying the liquid to be filtered through a head member;

a baffle extending on one side thereof above a flow of liquid from said distribution pipe; and

a discharge ramp carried adjacent an end of said baffle remote from said distributor pipe extending arcuately substantially in spaced relation to an inner surface of said drum above said conveyor;

whereby said means removing solids removes such solids collected between said drum and said discharge ramp and deposits same onto said conveyor.

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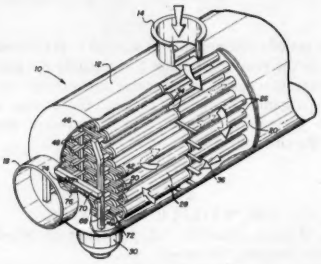
**4,298,474**

## MULTIPLE FILTER VESSEL

**Donald A. Sillers, Jr., Dallas, Tex., assignor to Peerless Manufacturing Company, Dallas, Tex.**

**Filed Dec. 14, 1979, Ser. No. 103,857**
**Int. Cl.³ B01D** *46/00*
**U.S. Cl. 210—238** **41 Claims**



1. A filter vessel comprising:

a longitudinal vessel body having forward and rearward ends;

an inlet port in said vessel body for admitting fluid to be filtered;

an outlet port in said vessel body for discharging filtered fluid;

an access port in said forward end of said vessel which is smaller in diameter than said vessel and large enough to permit passage of the arm of a person therethrough;

a plurality of horizontally disposed longitudinal elongated filter elements having an enclosing peripheral wall and forward and rearward ends positioned intermediate said inlet and outlet ports for filtering said fluid; and

mounting means, for mounting said filter elements longitudinally and horizontally within said vessel body proximate said forward end such that one or more of said filter elements is non-aligned with said access port, said mounting means comprising;

(a) support means for said forward end of said filter elements positions sufficiently close to the access port in the forward end of said vessel to permit placement and removal of the filter elements by a person whose body remains outside the vessel, and,

(b) locking means for allowing lateral movement of said filter elements in an unlocked mode and for retaining said filter elemetns in a horizontally disposed position intermediate said inlet and outlet ports in a locked mode.

**4,298,475**

## WATER PURIFICATION SYSTEM

**William J. Gartner, 153 Williamsburg Dr., Bartlett, Ill. 60103**

**Filed Jul. 18, 1980, Ser. No. 170,023**
**Int. Cl.³ B01D** *29/08*
**U.S. Cl. 210—266** **2 Claims**

1. A portable water purifying apparatus for treating contaminated water to provide drinking water solely from the passage of said contaminated water through said apparatus comprising an elongated tube having a diameter of a size as to allow suction to be applied by a user's mouth, said tube having an interior conduit connecting an upper outlet and a lower inlet, said conduit having successive adjacent sections from said inlet and said outlet, a first section containing a primary filter means for removing particulate matter, a second section containing a halogenated ion exchange resin for removing harmful bacteria, viruses and the like, a third section containing a secondary filtration material for removing additional particulate material, a fourth section containing activated carbon granules for removing undesirable odors, tastes and hydrocarbons, and a fifth section containing a secondary filter means for removing substantially all remaining particulate matter, whereby on the application of said suction when said lower inlet is inserted into a source of contaminated water, said contaminated water is treated to permit the ingestion of water directed from said upper outlet.

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**4,298,476**

## AIR BLADE CONSTRUCTION FOR CHIP WRINGER

**Robert H. Dudley, Portage, Mich., assignor to Reclamet, Inc., Kalamazoo, Mich.**

**Filed Dec. 10, 1979, Ser. No. 102,292**
**Int. Cl.³ B01D** *33/10*
**U.S. Cl. 210—373** **7 Claims**

1. A centrifuge for continuously separating a lubricating liquid from lubrication carrying metal shavings or the like, comprising:

a motor having a rotatable drive shaft;

substantially bell-shaped centrifugal separator bowl means having an annular side wall, an end wall, a shaving dispensing edge and openings in said side wall for the discharge of liquid therethrough and being located intermediate said end wall and said shaving dispensing edge;

an inlet conduit located at an open end of said separator bowl means for facilitating a delivery of said shavings at the center of said end wall, said inlet conduit terminating at a location axially spaced from said end wall;

power transmission means for transmitting rotatable output from said drive shaft to said separator bowl means;

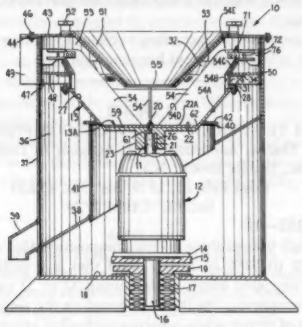
shaving collecting chamber means including an annular surface surrounding said shaving dispensing edge of said

separator bowl means radially outwardly spaced therefrom for collecting shavings discharged by centrifugal action from said separator bowl means;

an outlet duct means connected to said shaving collecting chamber means and having a central axis extending tangential of said shaving collecting chamber means and away therefrom;

whereby said shaving collecting chamber means will collect said shavings emanating from said dispensing edge and the kinetic energy of said moving shavings will effect a movement thereof along said annular surface and into said outlet duct means for discharge thereof; and

a plurality of angularly spaced blade means affixed to said end wall of said separator bowl means, said blade means extending axially of said separator bowl means away from



said end wall axially across said liquid discharge openings and terminating adjacent said shaving dispensing edge, each of said blade means having a continuous circumferentially facing surface along the axial length thereof for effecting a movement of air through said inlet means, into said shaving collecting chamber means and out through said outlet duct means to effect an entrainment of said shavings in said air movement for discharge cut through said outlet duct means, each of said blade means extending radially inwardly from said side wall, at least a blade portion of said blade means adjacent said discharge openings and said dispensing edge occupying a majority of the spacing between said inlet conduit and said side wall to thereby limit the bouncing of said shavings in said separator bowl means and out thereof before being brought up to the speed of rotation of said separator bowl means.

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**4,298,477**

## REGENERATION OF CATION ION-EXCHANGE POLISHERS

**Jack L. Cole, Naperville, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.**

**Continuation of Ser. No. 144,266, Apr. 28, 1980, abandoned. This application Nov. 6, 1980, Ser. No. 204,596**

**Int. Cl.³ B01J *49/00*; C02F *1/42***

**U.S. Cl. 210—674** **4 Claims**

1. A method of treating boiler condensate water to remove undesirable cations which comprises the steps of: providing a bed of cation-exchange resin; passing water which is to be treated through said resin bed; and regenerating said resin with an aqueous solution of a morpholine.

**4,298,478**

## METHOD OF, AND A MAGNETIC SEPARATOR FOR, SEPARATING MAGNETIZABLE PARTICLES FROM A FLUID

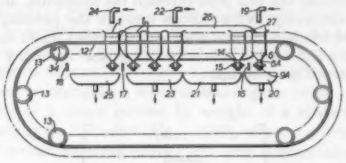
**James H. P. Watson, and James P. B. Jones, both of Cornwall, England, assignors to English Clays Lovering Pochin & Co., Ltd., Cornwall, England**

**Division of Ser. No. 950,543, Oct. 12, 1978, Pat. No. 4,214,986, which is a continuation of Ser. No. 792,015, Apr. 28, 1977, abandoned. This application Aug. 21, 1979, Ser. No. 68,500**

**Claims priority, application United Kingdom, Apr. 29, 1976, 17567/76**

**Int. Cl.³ B01D *35/06***

**U.S. Cl. 210—695** **5 Claims**



1. A method of separating magnetisable particles from a fluid utilizing a chain of separating chambers, each separating chamber having a closable outlet and a valve mean connected thereto in a bottom region thereof, and containing a respective fluid-permeable mass of magnetisable material, which method comprises performing the following operations on each separating chamber:

(a) at least partially filling the separating chambers with the outlet thereof closed with fluid containing magnetisable particles such that the fluid and magnetisable particles contact the mass of magnetisable material, the fluid and particles being prevented from escaping from the separating chamber during filling by the valve means being in a first position, for preventing flow through the outlet;

(b) either before, during or after filling, moving the separating chamber in a first direction into a separating zone in which a magnetic field is established by magnet means comprising pole pieces the faces of which are oriented in planes, the normals to which are parallel to a second direction, perpendicular to the first direction;

(c) keeping the said valve in its first position whereby the fluid containing the magnetisable particles is held, within the separating chamber, substantially stationary with respect to the mass of magnetisable material for a finite period of time after completion of steps (a) and (b);

(d) putting the valve in a second position, in which it allows flow through the outlet at a relatively slow rate, so as to drain fluid from the separating chamber in a third direction perpendicular to said first and second directions as the separating chamber passes through the separating zone after the said finite period of time;

(e) after draining, moving the separating chamber out of the separating zone, and

(f) removing magnetisable particles which have been retained within the mass of magnetisable material by magnetic attraction by putting the valve to a third position, in which it allows flow through the outlet at a relatively high rate, and flushing further fluid through the mass of magnetisable material, the valve thereafter being returned to its first position; wherein the separating chambers are moved one after another into and out of the separating zone.

**4,298,479**

## SECONDARY RECOVERY PROCESS UTILIZING THICKENED WATER

**Walter D. Hunter, Houston, Tex., assignor to Texaco Development Corporation, White Plains, N.Y.**

**Continuation-in-part of Ser. No. 876,389, Feb. 9, 1978, abandoned. This application Feb. 4, 1980, Ser. No. 118,283**

**Int. Cl.³ E21B** *43/22*

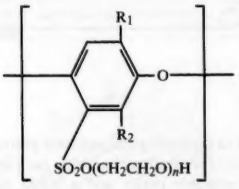
**U.S. Cl. 252—8.55 D** **10 Claims**

**1.** A process for recovering hydrocarbons from a subterranean hydrocarbon-bearing formation penetrated by an injection well and a production well which comprises:

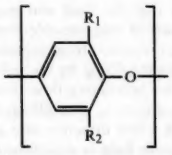
(a) injecting into the formation via an injection well a driving fluid comprising water having dissolved therein about 0.01 to about 2.0 weight percent of a water-soluble ethoxylated sulfonated poly-(2,6-dialkyl phenol) having a number average molecular weight of from about 5000 to about 250,000.

(b) forcing the said fluid through the formation, and

(c) recovering hydrocarbons through the production well and wherein the said water-soluble ethoxylated sulfonated poly-(2,6-dialkyl phenol) comprises recurring A-type units of the formula:




wherein $R_1$ and $R_2$ are independently selected straight chain alkyl groups of 1 to 3 inclusive carbon atoms and n is an integer of from 3 to about 30, and recurring B-type units of the formula:




wherein $R_1$ and $R_2$ have the same meaning as previously described and wherein in the said ethoxylated, sulfonated poly-(2,6-dialkyl phenol) the weight percent of A-type units ranges from about 20 to about 60 with the balance being B-type units.

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**4,298,480**

## DETERGENT SOFTENER COMPOSITIONS

**Harold E. Wixon, New Brunswick, N.J., assignor to Colgate Palmolive Co., New York, N.Y.**

**Continuation-in-part of Ser. No. 968,532, Dec. 11, 1978, Pat. No. 4,230,590. This application Nov. 21, 1979, Ser. No. 96,370**

**The portion of the term of this patent subsequent to Oct. 28, 1997, has been disclaimed.**

**Int. Cl.³ C11D** *1/86, 10/04, 17/06;* **D06M** *13/46*

**U.S. Cl. 252—8.75** **30 Claims**

**1.** A detergent softener composition capable of imparting improved softness, detergency, antistatic and soil antiredeposition properties to fabrics treated therewith in the wash cycle of a laundering process comprising spray-dried detergent particles including by weight from about 5 to 40% of water soluble nonsoap organic surfactant, at least about 90% thereof being of the anionic type, and from about 10 to 60% of water soluble, neutral to alkaline builder salt; and discrete particles of soap and discrete particles of cationic amine softener, wherein said soap particles do not contain cationic softener and said cationic softener particles do not contain soap, wherein said discrete particles are in admixture with said spray-dried detergent particles and said spray-dried detergent particles do not include cationic amine softener, and wherein said soap is a water solubie or dispersible fatty acid soap, and comprises from about 2 to 20% by weight of the composition, and said cationic softener is a cationic amine softener selected from the group consisting of (a) aliphatic di-(lower) $C_1$–$C_4$ alkyl, di(higher) $C_{14}$–$C_{24}$ alkyl quaternary ammonium salts (b) heterocyclic compounds, and mixtures of (a) and (b), said cationic softener comprising from about 2 to about 20% of said composition, the weight ratio of soap to softener being from about 8:1 to 1:3 and the percent concentration of anionic surfactant being at least about $1.5x+5$, wherein x represents the percent concentration of softener.

**13.** A composition according to claim **1** wherein said anionic detergent is linear dodecyl benzene sulfonate.

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**4,298,481**

## HIGH TEMPERATURE GREASE COMPOSITIONS

**David B. Clarke, Annandale, N.J., assignor to Tenneco Chemicals, Inc., Saddle Brook, N.J.**

**Filed Feb. 23, 1979, Ser. No. 15,533**

**Int. Cl.³ C10M** *7/24*

**U.S. Cl. 252—21** **12 Claims**

**1.** A high temperature grease composition that comprises

(a) 80% to 94% of a base fluid that is a dialkyl ester of hydrogenated dimer acids having 32 to 52 carbon atoms and containing less than 8% based on the weight of dimer acids of trimer acids, wherein each alkyl group has 5 to 16 carbon atoms;

(b) 0.2% to 6% of an additive system that comprises

(i) 0.1% to 2% of an antioxidant component that comprises an aromatic amine selected from the group consisting of secondary amines having the structural formula

wherein R′ and R″ each represents phenyl, alkylphenyl, naphthyl, or alkylnaphthyl; phenothiazine; alkylphenothiazines; alkoxyphenothiazines; alkyl-hydroxybenzylcarbazoles; and mixtures thereof;

(ii) 0.08% to 2% of a rust-inhibiting component selected from the group consisting of Group II metal salts, ammonium salts, and amine salts of petroleum sulfonic acids, alkylated naphthalene sulfonic acids, alkenylsuccinic acids, and sorbitan esters of $C_{10-18}$ fatty acids;

(iii) 0.01% to 1% of a metal-passivating component selected from the group consisting of benzimidazole, benzotriazole, alkylbenzotriazoles, aminobenzotriazoles, methylene bis benzotriazole, the reaction product of benzotriazole with $C_{12-18}$ secondary amines and formaldehyde, phenothiazine, naphthotriazole, salicylaldehyde semicarbazone, alkylsalicylaldehyde semicarbazones, $C_{12-18}$ fatty acid salts of salicylalaminoguanidine, and mixtures thereof; and

(iv) 0.01% to 1% of a load-bearing component selected from the group consisting of Group II metal diorgano dithiophosphates and thiocarbamates, amine salts of partially-esterified phosphoric and chlorophosphonic acids, alkyl mercaptothiadiazoles, aryl phosphates and thiophosphates, chlorinated diphenyls, polyphosphites, and mixtures thereof; and

(c) 5% to 20% of a thickener component that contains 4.7% to 19.8% of an oleophilic surface-modified clay and 0.2% to 1% of a dispersant selected from the group consisting of

$C_{2-6}$ alkylene glycols, fatty acids esters of said glycols, carbonates of said glycols, and lower alkyl ketones,

all percentages being percentages by weight based on the weight of the grease composition unless otherwise specified.

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**4,298,482**

## LOW TEMPERATURE PROCESS OF PREPARING $Mg(OH)_2$ SUSPENSIONS

**William J. Cheng, and David B. Guthrie, both of St. Louis, Mo., assignors to Petrolite Corporation, St. Louis, Mo.**

**Filed Jun. 20, 1979, Ser. No. 50,383**
**Int. Cl.³ C10M** *1/10, 3/02, 5/02, 7/02*
**U.S. Cl. 252—25** **14 Claims**

**1**. A process of preparing stable suspensions of $Mg(OH)_2$ which comprises blending at low or ambient temperatures $Mg(OH)_2$ powder with less than a stoichiometric amount of an acid in a relatively non-volatile, relatively stable fluid containing a dispersant which is oil soluble and which is capable of retaining the magnesium compound formed by particle size reduction in stable suspension so as to effect a reduction of the size of the particles of the starting $Mg(OH)_2$ powder to a size which is readily suspended and which is capable of becoming a lasting, fluid suspension, the total amount of acid present as a reactant and as the dispersant being less than the stoichiometric amount of acid required to react with the $Mg(OH)_2$ powder.

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**4,298,483**

## METAL FORMING LUBRICANTS

**Robert H. Davis, Pitman, and Richard S. Herd, Woodbury, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.**

**Filed Dec. 17, 1979, Ser. No. 104,494**
**Int. Cl.³ C10M** *1/48, 3/42*
**U.S. Cl. 252—32.7 HC** **15 Claims**

**1**. An antiwear/extreme pressure lubricant composition consisting essentially of a major amount of a hydrocarbon oil which has been phosphosulfurized in the presence of a metal oxide, the metal being selected from the group consisting of Group I or Group II of the Periodic Table, or cobalt, or molybdenum and a minor amount of an organic acid ester.

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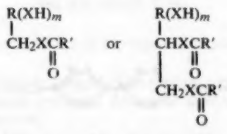
**4,298,484**

## NITROGEN-CONTAINING PRODUCTS OF PHOSPHOSULFURIZED ESTERS AND LUBRICANTS CONTAINING SAME

**Andrew G. Horodysky, Cherry Hill, and Joan M. Kaminski, Clementon, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.**

**Filed Apr. 21, 1980, Ser. No. 141,823**
**Int. Cl.³ C10M** *1/48*
**U.S. Cl. 252—46.7** **20 Claims**

**1**. A compound prepared by (1) reacting an ester or mixtures thereof of the formula



wherein m is from 1 to 4, X is oxygen or sulfur, R and R′ are hydrocarbyl groups having from 1 to 23 carbon atoms with a phosphorus polysulfide, wherein about 2 to about 12 moles of ester are reacted per mole of polysulfide and wherein the temperature of reaction is from about 60° C. to about 140° C., and then (2) reacting the product from (1) with at least a stoichiometric amount of an amine, the reaction temperature of this step being from about 50° C. to about 125° C.

**11**. A lubricant composition comprising a major proportion of a mineral or synthetic lubricanting oil or a grease therefrom and a friction reducing amount of the compound of claim **1**.

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**4,298,485**

## PROCESS OF PREPARING LUBRICATING OIL ADDITIVE CONTAINING TUNGSTEN

**John A. Powers, New Albany, and James N. Christini, Towanda, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.**

**Filed Jun. 16, 1980, Ser. No. 159,542**
**Int. Cl.³ C10M** *1/10, 1/54*
**U.S. Cl. 252—49.7** **7 Claims**

**1**. A process for producing a lubricating oil additive comprising a tertiary alkyl amine, greater than about 15 percent by weight tungsten, and less than about 3 percent by weight water said process comprising contacting an aqueous slurry consisting essentially of from about 3 to about 4 parts by weight water per part by weight ammonium paratungstate with about 3 parts by weight of an organic phase per part by weight ammonia paratungstate wherein said slurry comprises a solid portion of ammonium paratungstate, wherein said organic phase consists essentially of a major portion by weight of a tertiary alkyl amine having the formula $C_nH_{2n+1}NH_2$, where n is from 18 to 22, said contacting being carried out until substantially all of said solids are solubilized by extracting ammonium paratungstate from the aqueous phase into the organic phase while solid ammonium paratungstate is being solubilized into the aqueous phase, removing substantially all of the water present in the aqueous phase by subjecting said aqueous phase to vaporizing conditions to form a lubricating oil additive comprising less than about 3 percent by weight water and containing greater than about 15 percent by weight tungsten based on the amount of ammonium paratungstate used during contacting.

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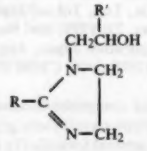
**4,298,486**

## FRICTION REDUCING ADDITIVES AND COMPOSITIONS THEREOF

**Andrew G. Horodysky, Cherry Hill, and Joan M. Kaminski, Clementon, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.**

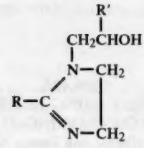
**Filed Nov. 23, 1979, Ser. No. 97,066**
**Int. Cl.³ C10M** *1/54, 1/10*
**U.S. Cl. 252—49.6** **12 Claims**

**1**. A lubricant composition comprising a major amount of an oil of lubricating viscosity or grease prepared therefrom and a minor amount of an additive, effective for providing friction reducing, copper anticorrosion, and antioxidant properties to said composition consisting of a boric acid salt or borate ester of a hydroxylakyl alkyl or alkenyl imidazoline in which said imidazoline has the following generalized structure:



where R is $C_5$–$C_{25}$ alkyl or alkenyl and R′ is hydrogen or $C_1$–$C_{25}$ alkyl.

**7**. A borated compound prepared by reacting an hydroxyalkyl alkyl or alkenyl imidazoline and boric acid in a solvent or mixture of solvents at temperatures of from 110° to 200° C. under reaction conditions whereby a boric acid salt or a borate ester of said imidazoline is prepared wherein said imidazoline is represented by the formula:



wherein R is $C_5$–$C_{25}$ alkyl or alkenyl group and $R^1$ is hydrogen or $C_1$–$C_6$ alkyl.

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**4,298,487**

## HYDRAULIC FLUID COMPOSITIONS COMPRISING BORATE ESTERS OF OXYALKYLATED HETEROCYCLIC OR ALICYCLIC AMINES

**Fumihide Genjida, Yawata; Kunio Kawakatsu, Kyoto, and Motohiko Ii, Uji, all of Japan, assignors to Sanyo Chemical Industries, Ltd., Kyoto, Japan**

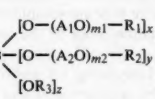
**Filed Apr. 4, 1980, Ser. No. 137,387**

**Claims priority, application Japan, Apr. 5, 1979, 54-41801**

**Int. Cl.³ C10M *3/26;* C09K *5/00***

**U.S. Cl. 252—75** **32 Claims**

**1**. A hydraulic fluid composition which comprises (A) at least one nitrogen atom-containing borate ester having the formula:



(1)

wherein $A_1$ and $A_2$ are independently $C_2$–$C_4$ alkylene, $R_1$ and $R_2$ are independently $C_1$–$C_4$ alkyl, $m_1$ and $M_2$ are independently 2 to 8, $R_3$ is a residue of an oxyalkylated heterocyclic amine or of an oxyalkylated alicyclic amine, x and y are zero, 1 or 2, z is 1, 2 or 3, and x, y and z satisfy the equation $x+y+z=3$, and when z is 2 or 3, $R_3$ are same or different; and (B) at least one fluid selected from the group consisting of (a) other borate esters, (b) polyoxyalkylene compounds, and (c) mixtures of (a) and (b), wherein component (A) is present in a sufficient amount to provide a composition having improved wet reflux boiling point with respect to conventional polyoxyalkylene hydraulic fluids and reduced tendency to form precipitates as compared with conventional borate ester hydraulic fluids in the rubber swelling test according to JIS rubber swelling test K 2233.

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**4,298,488**

## HYDRAULIC FLUID COMPOSITION CONTAINING GLYCOL ETHERS AND BORATE ESTER

**Yoshiharu Tanizaki; Kenichiro Minagawa, both of Yokohama, and Yoshinori Takano, Tokyo, all of Japan, assignors to Nippon Oil and Fats Co., Ltd., Tokyo, Japan**

**Filed Aug. 22, 1979, Ser. No. 68,697**

**Claims priority, application Japan, Aug. 26, 1978, 53-104297**

**Int. Cl.³ C09K *5/00;* C10M *3/16, 3/20***

**U.S. Cl. 252—78.1** **5 Claims**

**1**. A hydraulic fluid composition consisting mainly of (A) 20–60% by weight of polyoxyalkylene glycol monoalkyl ether having the following general formula (1); (B) 1–25% by weight of polyoxyalkylene glycol dialkyl ether having the following general formula (2); (C) 15–50% by weight of borate ester of polyoxyalkylene glycol monoalkyl ether having the following general formula (3),

$$R^1O(C_mH_{2m}O)_nH \quad (1)$$

$$R^1O(C_mH_{2m}O)_nR^2 \quad (2)$$

$$[R^1O(C_mH_{2m}O)_n]_3B \quad (3)$$

wherein $R^1$ and $R^2$ represent alkyl groups having 1–3 carbon atoms, $C_mH_{2m}O$ represents an oxyalkylene group, m represents a positive integer of 2–4, n represents a positive integer of 2–6, and the oxyethylene group content in the total oxyalkylene group of the compounds (1), (2) and (3) is 40–90% by weight; and (D) 1–25% by weight of a high molecular weight polyoxyalkylene compound having a kinematic viscosity of at least 8 cst at 100° C. and containing at least 90% by weight of polyoxyalkylene group in the molecule and 15–80% by weight of oxyethylene group based on the total oxyalkylene group in the molecule.

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**4,298,489**

## PHOSPHATE ESTER-BASED FIRE RESISTANT HYDRAULIC FLUID CONTAINING AN ALIPHATIC POLYESTER

**Kenjiro Ohba, Osaka; Kaichi Izumi, Tokyo, and Shinichiro Yasuda, Wakayama, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan**

**Continuation of Ser. No. 879,962, Feb. 21, 1978, abandoned. This application Jun. 28, 1979, Ser. No. 52,746**

**Claims priority, application Japan, Feb. 25, 1977, 52-20113**

**Int. Cl.³ C10M *3/40***

**U.S. Cl. 252—78.5** **12 Claims**

**1**. A fire-resistant hydraulic fluid consisting essentially of (a) a phosphate triester or a mixture thereof which is derived from phosphoric acid and an alcohol or a mixture thereof selected from the group consisting of phenol and alkyl-substituted phenols with the proviso that the ratio of the number of carbon atoms in the aliphatic hydrocarbon groups to the total number of carbon atoms in the triester is less than 0.16, and (b) 0.5 to 10% by weight, based on the weight of the phosphate triester, of an aliphatic polyester derived from an alkane-dicarboxylic acid having 3 to 24 carbon atoms and an alkylene glycol having 2 to 10 carbon atoms, said polyester having a molecular weight of 10,000 to 50,000.

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**4,298,490**

## PROCESS FOR THE PRODUCTION OF WASHING POWDERS OF STABILIZED OR ENHANCED APPEARANCE WHICH CONTAIN FLUORESCENT WHITENING AGENTS

**Burkhart Lange, Basel; Suresh C. Agarwal, Bottmingen; Werner Fringeli, Laufen, and Franz Günter, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

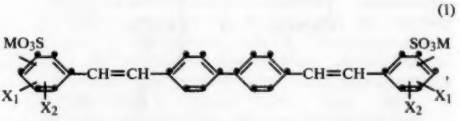
**Filed Dec. 10, 1979, Ser. No. 102,056**

**Claims priority, application Switzerland, Dec. 22, 1978, 13105/78; Sep. 12, 1979, 8251/79**

**Int. Cl.³ C09K *11/02, 11/06;* C11D *3/42, 11/00***

**U.S. Cl. 252—91** **19 Claims**

**1**. A process for the production of a washing powder of stabilized or enhanced appearance which contains one or more fluorescent whitening agents of the formula



(1)

wherein $X_1$ is hydrogen, chlorine, bromine, or alkyl or alkoxy, each containing 1 to 4 carbon atoms, $X_2$ is hydrogen or alkyl of 1 to 4 carbon atoms, and M is hydrogen, an alkali metal, ammonium or amine salt ion, which process comprises first dissolving or dispersing the fluorescent whitening agent or agents in a mixture of water and a polyvinyl alcohol or polyvinyl pyrrolidone polymer which is soluble or swellable in water, wherein the ratio of fluorescent whitening agent or agents to polymer in the aqueous solution or dispersion, or in the dry

powder obtained therefrom, is 9:1 to 1:10, and adding the solution or dispersion so obtained, which may additionally contain a polyethylene glycol, a surfactant containing ethyleneoxy and/or propyleneoxy groups, or a cellulose ether, to the washing powder slurry and subsequently drying this slurry, or, optionally after the addition of further washing powder components, spraying said solution or dispersion onto a dried unfinished washing powder.

8. A process according to claim 1, wherein the mixture of water and polyvinyl alcohol or polyvinyl pyrrolidone, in which the fluorescent whitening agent is dissolved or dispersed, additionally contains a polyethylene glycol, a surfactant containing ethyleneoxy and/or propyleneoxy groups, or a cellulose ether, in an amount of 1 to 50 times the amount of polyvinyl alcohol or polyvinyl pyrrolidone, or mixture thereof, present in the aqueous mixture.

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**4,298,491**

## PROCESS FOR MAKING DETERGENT COMPOSITIONS

**Andrew C. Coxon, Wirral; David J. Edge, Chester, and Mark L. L. Lapper, York, all of England, assignors to Lever Brothers Company, New York, N.Y.**

**Filed May 19, 1980, Ser. No. 150,824**

**Claims priority, application United Kingdom, May 17, 1979, 17226/79**

**Int. Cl.**[3] **C09K** *15/02, 15/20;* **C11D** *11/00, 11/02*

**U.S. Cl. 252—95** **7 Claims**

1. In a process for the production of a detergent powder by spray-drying an aqueous slurry comprising 3% or more by weight of a nonionic surfactant, the improvement which comprises inhibiting autoxidation by incorporating from 0.05 to 2% by weight of a charge transfer agent selected from the group consisting of stannic chloride, silver perchlorate, and iodine the percentages being based on the fully formulated detergent powder.

7. In a process for the production of a detergent powder by spray-drying an aqueous slurry comprising 3% or more by weight of a nonionic surfactant, the improvement which comprises inhibiting autoxidation by incorporating from 0.05 to 2% by weight of a charge transfer agent selected from the group consisting of 1, 3, 5 trinitobenzene; tetrachlorobenzoquinone; 1, 3, 5 triacetobenzene, 1, 2, 4 triacetobenzene; 1, 3, 5 trimethoxybenzene; 1, 2, 3 trimethoxybenzene; hexamethyl benzene; 1, 2, 4, 5 tetramethyl benzene and hexaketocyclohexane, the percentages being based on the fully formulated detergent powder.

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**4,298,492**

## BUILT LIQUID DETERGENT COMPOSITION

**Guido C. van den Brom, Nieuw-Beijerland, Netherlands, assignor to Lever Brothers Company, New York, N.Y.**

**Filed Jun. 9, 1980, Ser. No. 157,596**

**Claims priority, application United Kingdom, Jun. 21, 1979, 21744/79; Nov. 9, 1979, 38987/79**

**Int. Cl.**[3] **C11D** *7/56*

**U.S. Cl. 252—97** **4 Claims**

1. An aqueous, built liquid detergent composition comprising:

(a) from 2 to 20% by weight of an anionic, nonionic, cationic or zwitterionic synthetic detergent active compound or mixtures thereof;

(b) from 2 to 13% by weight of sodium tripolyphosphate;

(c) from 2 to 16% by weight of tetrapotassium pyrophosphate;

(d) from 0.1 to 8% by weight of an alkalimetal $C_8$–$C_{22}$ fatty acid soap;

(e) from 0.1 to 2% by weight of mono-, di- or triethanol or -isopropanolamine;

(f) from 1–15% by weight of a hydrotrope;

(g) from 40–75% by weight of water.

4. A composition according to claim 1, further comprising from 1.5 to 7.5% by weight of hydrogen peroxide.

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**4,298,493**

## METHOD FOR RETARDING GELATION OF BICARBONATE-CARBONATE-SILICATE CRUTCHER SLURRIES

**Ronald S. Schreiber, Highland Park, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.**

**Filed Oct. 4, 1979, Ser. No. 81,799**

**Int. Cl.**[3] **C11D** *7/12, 7/14, 11/02, 17/06*

**U.S. Cl. 252—135** **16 Claims**

1. A method of retarding or preventing the gelation of a miscible and pumpable crutcher slurry containing, by weight, from 40 to 70% of solids and 60 to 30% of water, of which solids content, on a 100% solids basis, 55 to 85% is sodium bicarbonate, 5 to 20% is sodium carbonate and 5 to 25% is sodium silicate of $Na_2O:SiO_2$ ratio within the range of 1:1.6 to 1:3, with the ratio of sodium bicarbonate:sodium carbonate being within the range of 2:1 to 8:1 and the ratio of sodium carbonate:sodium silicate being within the range of 1:3 to 3:1, which comprises preparing at a temperature in the range of 40° C. to 70° C. a crutcher slurry of the described composition containing a gelation preventing proportion, from 0.1 to 2%, of a material selected from the group consisting of citric acid, water soluble citrates and mixtures thereof, and mixing such composition in the crutcher during preparation and thereafter.

12. A miscible and pumpable crutcher slurry comprising, by weight from 40 to 70% of solids and 60 to 30% of water, of which solids content, on a 100% solids basis, 55 to 85% is sodium bicarbonate, 5 to 20% is sodium carbonate and 5 to 25% is sodium silicate of $Na_2O:SiO_2$ ratio within the range of 1:1.6 to 1:3, with the ratio of sodium bicarbonate:sodium carbonate being within the range of 2:1 to 8:1 and the ratio of sodium carbonate:sodium silicate being within the range of 1:3 to 3:1, and a gelation preventing proportion, from 0.1 to 2%, of a material selected from the group consisting of citric acid, water soluble citrates and mixtures thereof.

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**4,298,494**

## SHAMPOO

**Michael W. Parslow, Upton by Chester, and Stuart J. Sime, South Wirral, both of England, assignors to Lever Brothers Company, New York, N.Y.**

**Filed Mar. 14, 1980, Ser. No. 130,298**

**Claims priority, application United Kingdom, Mar. 27, 1979, 10636/79**

**Int. Cl.**[3] **A61K** *7/08, 7/06*

**U.S. Cl. 252—174.16** **5 Claims**

1. An aqueous shampoo consisting essentially of:

(A) from 5% to 30% by weight of a detergent selected from alkyl sulphate and alkyl ether sulphate detergents;

(B) from 0.05% to 2% by weight of a cationic derivative of a polygalactomannan gum; and

(C) from 0.1% to 3% by weight of an anionic additive comprising at least one of

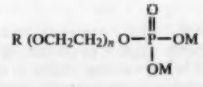
(i) a carboxylate of the formula

$$R(OCH_2CH_2)_nCOOM$$

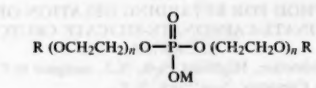
(ii) a sulphate of the formula

$$ROSO_3M$$

(iii) a phosphate ester selected from the group consisting of monoesters of the formula



and diesters of the formula



and mixtures thereof

in which formulae R is a hydrocarbon group having 8 to 22 carbon atoms, n is 0 or an integer of from 1 to 10, and M is selected from the group consisting of hydrogen and alkali metal, ammonium and amine salt forming groups, with the proviso that when the anionic additive component (C) is a sulphate the detergent component (A) is an alkyl ether sulphate.

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**4,298,495**

## PROCESSES FOR REDUCING THE OXYGEN CONTENT OF METAL OXIDES

**Robin H. James, Burghfield Common, and James A. Spooner, Reading, both of England, assignors to United Kingdom Atomic Energy Authority, London, England**

**Filed Dec. 29, 1977, Ser. No. 865,588**

**Claims priority, application United Kingdom, Jan. 6, 1977, 379/77**

**Int. Cl.³ G21C** *3/62, 21/00*

**U.S. Cl. 252—643** **3 Claims**

1. A process for reducing the oxygen content of metal oxide material by contacting the material with a hydrogen-containing gas at an elevated temperature and removing water formed during said reduction which comprises locating said material in each of a plurality of carbon crucibles having apertured ends but being otherwise closed, the interior walls of each of said carbon crucibles being provided with a layer selected from molybendum, tungsten and uranium carbide, moving the crucibles in end-to-end contact through a heated zone and thereby forming a duct, passing hydrogen-containing gas through said duct countercurrent to the direction of movement of the crucibles through the heated zone to reduce the oxygen content of said material, said layer reducing reaction between said material and the carbon of the crucible but not preventing reaction between water formed during said reduction and the carbon of the crucible.

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**4,298,496**

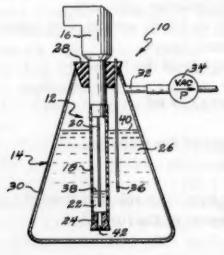
## HIGHLY STABLE AEROSOL GENERATOR

**Henry S. DeFord, and Mark L. Clark, both of Kennewick, Wash., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed Sep. 19, 1980, Ser. No. 188,435**

**Int. Cl.³ B01F** *3/04*

**U.S. Cl. 252—359 A** **4 Claims**




1. An aerosol spray device comprising, an aspirating assembly, a makeup assembly capable of containing a makeup solution and capable of being vacuum sealed, a vacuum pressure means attached to said makeup assembly and capable of introducing a vacuum into said makeup assembly, an interconnection means for coupling said aspirating assembly and said makeup assembly, said interconnection means capable of allowing communication between solutions introduced into said aspirating assembly and said makeup assembly and a vent tube open at each end with one end in communication with the atmosphere and the other end of said vent tube in communication with the inside of said makeup assembly capable of containing a makeup solution.

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**4,298,497**

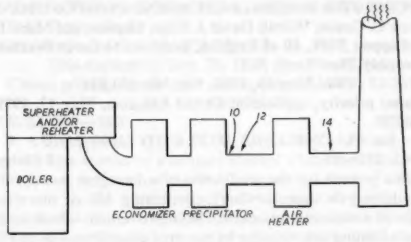
## COMPOSITION FOR PREVENTING COLD END CORROSION IN BOILERS

**Paul T. Colombo, Downers Grove, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.**

**Filed Jan. 21, 1980, Ser. No. 113,545**

**Int. Cl.³ C10L** *10/04;* **C23F** *11/02, 11/18*

**U.S. Cl. 252—387** **10 Claims**




1. A composition for neutralizing acid corrosive agents in a flowing vapor medium, said composition comprising: a particulate carrier comprising a colloidal hydrated aluminum silicate; and a particulate, active neutralizing agent having a relatively small surface area surface-coated on said carrier.

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**4,298,498**

## CONTROL REAGENT FOR TEST STRIPS FOR DETERMINING UROBILINOGEN IN URINE

**Helmut Rehner, Weilheim, and Walter Rittersdorf, Mannehim-Waldhof, both of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim Waldhof, Fed. Rep. of Germany**

**Filed Dec. 13, 1979, Ser. No. 103,025**

**Claims priority, application Fed. Rep. of Germany, Dec. 21, 1978, 2855363**

**Int. Cl.³ C09K** *3/00;* **G01N** *33/48*

**U.S. Cl. 252—408** **14 Claims**

1. An artificial human urine control reagent for analytical test strips used in analyzing human urine, comprising a mixture of a component selected from 2, 4-dimethylpyrrole-3-carboxylic acid, alkali metal salts thereof and alkaline earth metal salts thereof as a substitute for naturally occurring urobilinogen in human urine and at least one other component which is or simulates a diagnostically relevant component of human urine, the ratio of urobilinogen substitute to said other at least one component simulating conditions naturally occurring in human urine.

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**4,298,499**

## RECOVERY OF CATALYSTS

**Tamotsu Imai, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.**

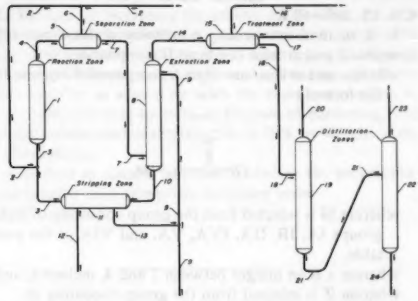
**Filed Jul. 14, 1980, Ser. No. 167,947**

**Int. Cl.³ B01J** *31/40, 31/18;* **C07C** *27/22;* **C01G** *55/00*

**U.S. Cl. 252—414** **16 Claims**

1. In a process for the recovery of trace amounts of a Group VIII metallic catalyst from a hydroformylation reaction product consisting essentially of an alcohol derived from hydrofor-

mylation of an olefinic hydrocarbon with carbon monoxide and hydrogen at hydroformylation conditions in the presence of a Group VIII metal catalyst and a monoamine modifier, the improvement which comprises, after hydroformylation, contacting at a temperature in the range of from about 20° to about 300° C. and a pressure in the range of from about 1 atmosphere to about 200 atmospheres said hydroformylation reaction product consisting essentially of an alcohol with a biphyllic ligand compound selected from the group consisting of arsenic, nitrogen, oxygen, phosphorous, sulfur, tellurium, antimony, germanium and tin compounds capable of forming a soluble and stable complex with said Group VIII metallic catalyst to separate and recover said trace amounts of Group VIII metallic catalyst.




7. The process as set forth in claim 1 in which said biphyllic ligand capable of forming a soluble complex with a Group VIII metallic catalyst comprises bis(1,2-diphenylphosphino)ethane.

8. The process as set forth in claim 1 in which said biphyllic ligand capable of forming a soluble complex with a Group VIII metallic catalyst comprises methyldiphenylarsine.

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**4,298,500**

## MIXED PHASE CHROMATOGRAPHIC COMPOSITIONS

**Seth R. Abbott, Concord, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.**

**Filed May 5, 1980, Ser. No. 146,711**
**Int. Cl.³ B01D** *15/08*
**U.S. Cl. 252—428** **38 Claims**

1. A mixed phase composition comprising a porous particle suitable for use in chromatography having a first residue covalently bonded, to less than the maximum number of sterically available support matrix active sites, said first residue being capable of separating multiple-sorbable-sited compounds, said particle also having a second residue covalently bonded to other of the sterically available support matrix active sites, said second residue being inert or substantially inert to said compounds; said first and second residues being directly attached to said active sites.

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**4,298,501**

## TECHNIQUE TO REDUCE THE ZEOLITE MOLECULAR SIEVE SOLUBILITY IN AN AQUEOUS SYSTEM

**Santi Kulprathipanja, Hoffman Estates, Ill., assignor to UOP Inc., Des Plaines, Ill.**

**Continuation-in-part of Ser. No. 48,955, Jun. 15, 1979, Pat. No. 4,248,737. This application Oct. 30, 1980, Ser. No. 202,047**
**Int. Cl.³ B01J** *20/18, 20/22*
**U.S. Cl. 252—430** **12 Claims**

1. A method for the manufacture of an adsorbent comprising zeolitic crystalline aluminosilicate and a water permeable organic polymer binder suitable for use in a process for the separation of a component from a feed mixture comprising an aqueous solution of a mixture of components, which method comprises:

(a) mixing together a powder of said crystalline aluminosilicate, a powder of said binder and acetic acid solvent to form a malleable mixture;

(b) forming said malleable mixture into discrete formations;

(c) removing said solvent from said formations to obtain hard dry formations; and

(d) breaking said hard dry formations into particles of desired sizes.

7. The method of claim 1 further characterized in that said water permeable organic polymer comprises a cellulose ester or cellulose nitrate.

8. The method of claim 1 further characterized in that said crystalline aluminosilicate is selected from the group consisting of X zeolites and Y zeolites.

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**4,298,502**

## CATALYTIC COMPOSITE PARTICULARLY USEFUL FOR THE OXIDATION OF MERCAPTANS AND THE REMOVAL OF GUMS CONTAINED IN A SOUR PETROLEUM DISTILLATE

**David H. J. Carlson, Park Ridge, Ill., assignor to UOP Inc., Des Plaines, Ill.**

**Continuation-in-part of Ser. No. 143,119, Apr. 23, 1980, which is a continuation of Ser. No. 958,303, Nov. 6, 1978, Pat. No. 4,206,043. This application Dec. 10, 1980, Ser. No. 214,856**
**Int. Cl.³ B01J** *31/08, 31/22*
**U.S. Cl. 252—431 N** **11 Claims**

1. A regeneratable, gum resistant catalytic composite for sweetening a sour petroleum distillate, prepared by the method comprising:

(a) washing a basic anion exchange resin with an alcohol;

(b) contacting said basic anion exchange resin with an aqueous caustic solution of a metal phthalocyanine mercaptan oxidation catalyst to produce a catalyst-impregnated basic anion exchange resin; and

(c) drying said catalyst-impregnated basic anion exchange resin.

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**4,298,503**

## METHOD OF PREPARING CALCIUM BORON PHOSPHATE CATALYST

**Oleg E. Batalin, ulitsa Ordzhonikidze, 45, kv. 85; Arkady S. Dykman, ulitsa Leni Golikova, 37, korpus 4, kv. 15; Alexandr I. Osadchenko, ulitsa Sofiiskaya, 23, korpus 2, kv. 174; Galina F. Balkhanova, ulitsa Telmana, 48, korpus 3, kv. 60, all of Leningrad; Izrail M. Belgorodsky, Molodezhny bulvar, 50, kv. 25, Tolyatti; Vladimir I. Nevstruev, ulitsa Karla Marxa, 52, kv. 31, Tolyatti; Valery A. Radionov, ulitsa Matrosova, 30, kv. 180, Tolyatti; Eduard A. Tulchinsky, ulitsa Ushakova, 46, kv. 12, Tolyatti; Valentin M. Belyaev, prospekt Lenina, 32, kv. 20, Volzhsky; Jury I. Smolin, ulitsa Lenina, 97, kv. 494, Volzhsky; Mark I. Breiman, ulitsa Chaikovskogo, 17, kv. 12, Volzhsky; Vitaly V. Orlyansky, ulitsa Pionerskaya, 8a, kv. 4, Volzhsky; Nikolai Y. Zhirnov, ulitsa Sovetskaya, 59, kv. 35, Volzhsky; Nikolai V. Galibin, ulitsa Pushkina, 122, kv. 49, Volzhsky; Adrian P. Troitsky, ulitsa Miklukho-Maklaya, 65, korpus 2, kv. 48, Moscow, and Vladimir V. Kovalenko, ulitsa Tsiolkovskogo, 7/2, kv. 38, Voronezh, all of U.S.S.R.**

**Filed Mar. 24, 1980, Ser. No. 133,647**
**Int. Cl.³ B01J** *37/02, 21/02*
**U.S. Cl. 252—432** **8 Claims**

1. Method of preparing a calcium boron phosphate catalyst, which comprises reacting a calcium salt with a phosphoric acid salt in aqueous ammonia, thereby forming a reaction mixture including a precipitate, separating the thus formed precipitate from the reaction mixture, shaping said precipitate to a predetermined shape drying the thus shaped precipitate, and heat treating the shaped, dried precipitate at an elevated temperature in the presence of steam or steam with an inert gas, said steam or steam with inert gas being mixed with at least one of the components selected from the group consisting of boric acid and a mixture of boric and phosphoric acids, thereby forming a shaped calcium boron phosphate catalyst.

4,298,504

## ATTENUATED SUPERACTIVE MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Bartlett, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 970,049, Dec. 15, 1978, Pat. No. 4,235,705, which is a continuation-in-part of Ser. No. 833,332, Sep. 14, 1977, Pat. No. 4,165,276. This application Jun. 18, 1980, Ser. No. 166,214

The portion of the term of this patent subsequent to Jun. 12, 1996, has been disclaimed.

Int. Cl.[3] B01J *27/08, 27/10, 23/64*

U.S. Cl. 252—441 18 Claims

1. A catalytic composite comprising a combination of a catalytically effective amount of a pyrolyzed rhenium carbonyl component with a porous carrier material containing a uniform dispersion of catalytically effective amounts of a platinum group component, which is maintained in the elemental metallic state during the incorporation of the rhenium carbonyl component, and of a bismuth component.

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4,298,505

## RESISTOR COMPOSITION AND METHOD OF MANUFACTURE THEREOF

William G. Dorfeld, Lindley, and Robert J. Settzo, Painted Post, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Nov. 5, 1979, Ser. No. 91,375

Int. Cl.[3] H01B *1/06*

U.S. Cl. 252—513 14 Claims

1. A resistor having improved stability and temperature coefficient of resistance consisting essentially of nickel, chromium and silicon, the concentration by weight of each being in the ranges specified by the polygon AB, BD, DC, CA as shown in the drawing.

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4,298,506

## METHOD OF TREATING SILVER OXIDE POWDER AND THE PRODUCT FORMED THEREFROM

Franciszek J. Przybyla, Mississauga, and Eleanor J. Rossler, Lorne Park, both of Canada, assignors to Duracell International Inc., Bethel, Conn.

Filed Nov. 3, 1978, Ser. No. 957,598

Int. Cl.[3] H01B *1/06*

U.S. Cl. 252—518 14 Claims

1. A process for producing silver oxide for use in the cathode of an alkaline silver oxide galvanic cell, including the steps of partially reducing a mixture having at least 10% divalent silver oxide powder, the remainder including at least a minor amount of monovalent silver oxide powder, by reacting said silver oxide powder mixture with a surfactant and removing the reagent from the reacted silver oxide powder mixture.

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4,298,507

## FLEXIBLE MARKING COMPOSITION FOR PENCILS

Roque O. L. Leon, Buenavista No. 46, Mexico 14, D. F., Mexico

Filed Jun. 16, 1980, Ser. No. 159,936

Claims priority, application Mexico, Mar. 11, 1980, 181502

Int. Cl.[3] C09D *13/00*

U.S. Cl. 260—4 AR 10 Claims

1. A flexible marking composition comprising a vulcanized slurry including by weight about 15–22% elastomer selected from the group consisting essentially of natural rubber and synthetic rubber, about 3–9% plasticizers selected to include at least in part cumarone resin, about 2% vulcanizing agent, about 45–65% pigment, about 1–3% vulcanizing activator and accelerator, and about 10% desiccant for sequestrating moisture from the slurry and for inhibiting gas generation during vulcanizing, and the balance pigment carrier.

4,298,508

## POLYMER CURING SYSTEM, AIR-CURABLE COMPOSITION AND METHOD OF PREPARING THE COMPOSITION

Charles M. Lamb, III, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 954,037, Oct. 23, 1978, Pat. No. 4,224,200. This application Jun. 12, 1980, Ser. No. 158,767

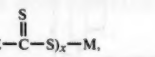
The portion of the term of this patent subsequent to Sep. 23, 1997, has been disclaimed.

Int. Cl.[3] C08L *91/00*

U.S. Cl. 260—18 R 41 Claims

1. A method comprising combining at least one type A compound and at least one type B compound,

wherein said at least one type A compound is represented by the formula



wherein M is selected from the group consisting of metals in groups IA, IB, IIA, IVA, VA, and VIA of the periodic table,

wherein x is an integer between 1 and 4, inclusive, and

wherein Z is selected from the group consisting of

(1) an amino group having the formula $H_2N$—,

(2) a disubstituted amino group having the formula RR'N—,

(3) a monosubstituted amino group having the formula HRN—, and

(4) a heterocyclic amino group,

wherein R and R' can be the same or different and each comprises a hydrocarbyl group having from 1 to about 18 carbon atoms, and

wherein said at least one type B compound is selected from the group consisting of Group VIIB metal compounds of carboxylic acids, Group VIII metal compounds of carboxylic acids, Group VIIB metal compounds of beta diketones, and Group VIII metal compounds of beta diketones.

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4,298,509

## NONINFLAMMABLE OLEFIN FIBERS AND METHOD OF PRODUCING SAME

Antonio Fochesato, Via Romana Rompato 19, Schio (Vicenza), Italy

Continuation-in-part of Ser. No. 864,459, Dec. 27, 1977, Pat. No. 4,193,911. This application Sep. 12, 1979, Ser. No. 74,903

Claims priority, application Italy, Oct. 5, 1977, 85639 A/77

Int. Cl.[3] C08K *3/22, 3/32, 5/02, 5/06*

U.S. Cl. 260—29.1 SB 29 Claims

1. Noninflammable olefinic-resin fibers, which fibers contain in combination as fire-retardant agents:

(a) from about 0.5% to 15% by weight of a hydrated alumina, which alumina has been treated to permit the alumina to be incorporated into the olefinic-resin composition from which the fibers are produced;

(b) from about 0.5% to 8.0% by weight of a halogenated organic compound selected from the group consisting of

(i) a polyhalo cyclohexane, and

(ii) a polyhalo diphenyl oxide;

(c) from about 0.5% to 8.0% by weight of ammonium polyphosphate; and

(d) the olefinic fibers being noninflammable when tested by ASTM-D635-74.

4,298,510

## HARDENABLE RESIN COMPOSITIONS

John Cooper, West Kilbride, Scotland, assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 565,701, Apr. 7, 1975, abandoned. This application Feb. 22, 1977, Ser. No. 770,431

Claims priority, application United Kingdom, Apr. 23, 1974, 17673/74

Int. Cl.[3] C08L *67/00*

U.S. Cl. 260—29.2 E 25 Claims

1. A method of increasing the gelling and setting rate of a polymerisation hardenable liquid resin composition comprising polymerising the resin with the aid of a hardening catalyst in the presence of two or more additional substances which are reacted together in admixture with the resin composition to produce sufficient heat to increase the rate of hardening, said additional substances constituting 5% to 30% by weight of the total composition.

8. A method as claimed in claim 1 wherein the polymerisation hardenable resin comprises polyester resin.

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4,298,511

## URETHANE RHEOLOGY MODIFIERS AND COMPOSITIONS CONTAINING SAME

Karl F. Schimmel, Verona; Jerome A. Seiner, Pittsburgh; Rostyslaw Dowbenko, and Roger M. Christenson, both of Gibsonia, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 1, 1980, Ser. No. 174,479

Int. Cl.[3] C08G *18/48*

U.S. Cl. 260—29.2 TN 44 Claims

1. A urethane rheology modifier characterized in having a branched structure, substantially no terminal hydrophobic groups and capable of modifying the rheology properties of water-based and organic solvent-based compositions, derived from the reaction of (a) for each from about 8 moles to about 14 moles of a polyalkylene oxide having a molecular weight of from about 2,000 to about 20,000; (b) from about 0.5 moles to about 5 moles of a polyfunctional material; (c) from about 9 moles to about 90 moles of a diisocyanate; and (d) from about 3 moles to about 70 moles water.

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4,298,512

## UREA FORMALDEHYDE DISPERSIONS MODIFIED WITH HIGHER ALDEHYDES

Paul Sartoretto, North Brunswick, and Kak-Yuen Tao, Highland Park, both of N.J., assignors to W. A. Cleary Chemical Corporation, Somerset, N.J.

Filed Apr. 24, 1980, Ser. No. 143,367

Int. Cl.[3] C08L *61/24*

U.S. Cl. 260—29.4 R 24 Claims

1. A process for preparing a dispersion of a urea aldehyde polymer which comprises:

(a) reacting urea with formaldehyde and a higher aldehyde having from 2 to 4 carbon atoms, wherein the mole ratio of formaldehyde to said higher aldehyde is at least 2:1, in aqueous medium in the presence of an acid catalyst to form a dispersion of urea aldehyde polymer in said aqueous medium; and

(b) neutralizing said dispersion.

4,298,513

## BINDER FOR PAPER-COATING COMPOSITIONS

Dieter Distler, Mutterstadt; Margarete Mueller; Hans-Georg Bubam, both of Ludwigshafen, and Guenther Addicks, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Sep. 15, 1980, Ser. No. 186,844

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1979, 2939657

Int. Cl.[3] C08L *33/02*

U.S. Cl. 260—29.7 H 9 Claims

1. An aqueous dispersion of a butadiene-styrene copolymer which comprises:

(a) from 25 to 57.5% by weight of a mixture of butadiene and copolymerized units of an acrylic acid ester of an alcohol of 1 to 4 carbon atoms, said mixture not being less than 15% by weight of butadiene units,

(b) from 40 to 70% by weight of styrene,

(c) from 1 to 5% by weight of maleic acid or maleic anhydride and

(d) from 1.5 to 7% by weight of methacrylamide, as copolymerized units.

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4,298,514

## FLAME RETARDANT THERMOPLASTIC POLYPHENYLENE ETHER RESIN COMPOSITIONS

Gim F. Lee, Jr., Albany, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Division of Ser. No. 671,342, Mar. 29, 1976, Pat. No. 4,203,931. This application Oct. 22, 1979, Ser. No. 87,163

Int. Cl.[3] C08K *5/10, 5/54;* C08L *83/12*

U.S. Cl. 260—29.1 SB 17 Claims

1. A self-extinguishing, non-dripping thermoplastic molding composition which comprises:

(i) a polyphenylene ether resin;

(ii) a styrene resin;

(iii) a halogenated aromatic flame retardant compound;

(iv) an antimony containing compound; and

(v) an additive selected from the group consisting of alkyl esters of trimellitic acid, epoxy stearates, epoxy tetrahydrophthalates, diorganopolysiloxane fluids, alkyl esters of adipic acid, alkyl esters of glycolic acid and dialkyl phthalates.

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4,298,515

## PROCESS FOR THE PREPARATION OF POLYMERS CONTAINING HYDANTOIN GROUPS

Jürgen Lewalter; Ludwig Rottmaier, both of Odenthal; Rudolf Merten, Leverkusen; Wilfried Zecher, Leverkusen; Willi Dünwald, Leverkusen, and Bernhard Schulte, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 6, 1979, Ser. No. 100,870

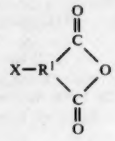
Claims priority, application Fed. Rep. of Germany, Dec. 16, 1978, 2854383

The portion of the term of this patent subsequent to May 26, 1998, has been disclaimed.

Int. Cl.[3] C08G *18/06*

U.S. Cl. 260—30.4 N 10 Claims

1. A process for the preparation of poly(thio) hydantoins containing amidoimide groups comprising reacting a polyfunctional α-aminocarboxylic acid, amide or ester with organic polyiso(thio)cyanates wherein the reaction is carried out in a lactone solvent with the addition of a carboxylic acid anhydride of the formula



wherein $R^1$ is a $C_2$–$C_{10}$ aliphatic moiety, a $C_5$–$C_{10}$ cycloaliphatic moiety of a $C_6$–$C_{20}$ aromatic moiety, and X is another cyclic anhydride moiety, a carboxyl or a hydroxyl.

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**4,298,516**

## COMPOSITION OF MATTER

**Lynn J. Taylor, Haslett, Mich., and John D. Grier, Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio**

**Continuation of Ser. No. 302,062, Oct. 30, 1972, abandoned, which is a division of Ser. No. 174,197, Aug. 23, 1971, Pat. No. 4,014,845. This application Oct. 13, 1976, Ser. No. 731,956**

**Int. Cl.³ C08K** *3/40*

**U.S. Cl. 260—31.8 R** **9 Claims**

1. As a composition of matter a particulate inorganic material dispersed in a fugitive vehicle system, said particulate material having a fusion temperature and said fugitive vehicle system comprising at least two organic components, at least one component being a polymeric material which is a solid at ambient temperature, has a pyrolysis temperature of about 250° C. to about 450° C. and below said fusion temperature of said particulate material and following pyrolysis in a non-oxygen containing environment, leaves no carbonaceous residue having a deleterious effect on said particulate material, said polymeric material having oxygen atoms selectively incorporated in its molecular chain and being at least one pyrolyzable solid polymer or copolymer selected from the group consisting of polyethers, copolymers and terpolymers and quadpolymers of oxygen and at least one monomer of alkyl methacrylate, poly (trimethylene carbonate), poly(beta-propiolactone), poly(delta-valerolactone), poly(ethylene carbonate), poly(propylene carbonate), and poly(ethylene oxalate), and at least one other component being a solvent for dissolving said copolymeric material, said solvent being a liquid at ambient temperature and having a volatilization or decomposition temperature range of about 200° C. to about 350° C., but below the pyrolysis temperature of said polymeric material.

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**4,298,517**

## TETRAHALOPHTHALATES AS FLAME RETARDANT PLASTICIZERS FOR HALOGENATED RESINS

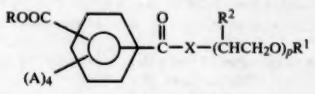
**Stanley R. Sandler, Springfield, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.**

**Continuation-in-part of Ser. No. 972,601, Dec. 22, 1978, abandoned. This application Aug. 23, 1979, Ser. No. 68,987**

**Int. Cl.³ C08K** *5/12;* **C08J** *3/18*

**U.S. Cl. 260—31.8 HA** **10 Claims**

1. A composition comprising a halogenated resin and a flame and smoke retarding amount of a plasticizer of the structure:



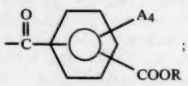
(I)

wherein

(a) the ring can have all possible isomeric arrangements:

(b) R is selected from the group consisting of hydrogen, an alkyl of 1 to 10 carbons, hydroxyalkyl of 2 to 10 carbons, and polyhydroxyalkyl of 3 to 10 carbons;

(c) $R^1$ is selected from the group consisting of hydrogen, an alkyl or substituted alkyl of 1 to 12 carbons, or



;

(d) $R^2$ is independently selected from the class consisting of H and $CH_3$—;

(e) p is an integer of 4 to 50;

(f) x is selected from O or NH; and

(g) A is selected from Cl or Br.

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**4,298,518**

## POLYAMIDE RESIN COMPOSITION

**Yasuhiro Ohmura; Yukinobu Murakami, and Ryoji Hidaka, all of Kita-Kyushu, Japan, assignors to Mitsubishi Chemical Industries, Ltd., Tokyo, Japan**

**Filed Aug. 24, 1977, Ser. No. 827,256**

**Claims priority, application Japan, Sep. 6, 1976, 51-106530; Feb. 23, 1977, 52-18974; Jul. 6, 1977, 52-40167**

**Int. Cl.² C08K** *5/09, 5/20, 5/34*

**U.S. Cl. 260—32.6 NA** **6 Claims**

1. A polyamide resin composition which comprises a polyamide resin and from 1 to 20 wt.% of melamine cyanurate.

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**4,298,519**

## PLASTICIZER-CONTAINING THERMOCURABLE COMPOSITION

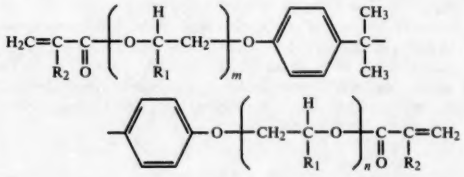
**Johan H. Cordes, Naarden, and Wilhelmus F. M. Roes, Beek, both of Netherlands, assignors to Akzo N.V., Arhem, Netherlands**

**Filed May 30, 1978, Ser. No. 910,539**

**Int. Cl.³ C08K** *5/02;* **C08L** *67/00*

**U.S. Cl. 260—33.8 UA** **9 Claims**

1. A thermocurable composition based on an ethylenically unsaturated ester having the general formula:



wherein $R_1$ and $R_2$ may be the same or different and represent a hydrogen atom or a methyl group, and m and n are numbers whose average is in the range of 1.0 to 3.0, characterized in that the composition contains as a plasticizer 2 to 60% by weight (calculated on the ethylenically unsaturated ester) of a chlorine-containing paraffin having an average molecular weight of 250 to 900 and an average chlorine content of 35 to 75% by weight.

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**4,298,520**

## PHENOLIC ESTER SYNTHETIC RESIN STABILIZERS

**Motonobu Minagawa, Koshigawa; Yutaka Nakahara, Iwatsuki, and Masayuki Takahashi, Tokorozawa, all of Japan, assignors to Argus Chemical Corp., Brooklyn, N.Y.**

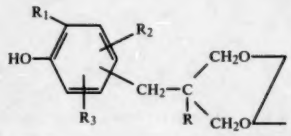
**Division of Ser. No. 846,721, Oct. 31, 1977, Pat. No. 4,171,298. This application Oct. 11, 1979, Ser. No. 83,789**

**Claims priority, application Japan, Nov. 1, 1976, 51-13162**

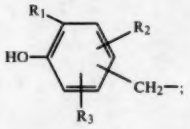
**Int. Cl.³ C08K** *5/53, 5/52;* **C07C** *39/17, 39/06;* **C07D** *251/34*

**U.S. Cl. 260—45.8 R** **41 Claims**

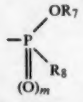
1. An ortho-alkylhydroxybenzylpropane-1,3-diol compound having the formula



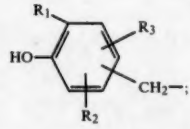
in which $R_1$ is an alkyl group having 1 to 8 carbon atoms, $R_2$ and $R_3$ are hydrogen or alkyl groups having 1 to 8 carbon atoms, R is hydrogen, an alkyl group having 1 to 8 carbon atoms, an alkenyl group having 2 to 8 carbon atoms, or an ortho-alkylhydroxybenzyl group



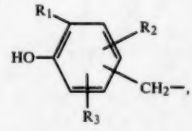
and Z is selected from the group consisting of singly linked phosphorus ester groups and double linked phosphorus ester groups taken in sufficient number to satisfy the valences of the two propanediol oxygen atoms; the singly linked phosphorus ester Z groups having the formula



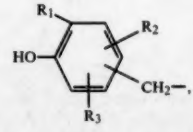
in which m is 0 or 1; $R_7$ is the residue obtained by reaction of one hydroxyl group of an aliphatic or aromatic compound having 1 to 40 carbon atoms, and 1 to 4 hydroxyl groups; $R_8$ is —O—$R_7$, alkyl having 1 to 8 carbon atoms, phenyl, benzyl, or



and the doubly linked phosphorus ester Z groups having the formula



in which m is 0 or 1 and p is 0, 1, 2, or 3; when p is 0 $R_6$ is alkyl, phenyl, benzyl,



or a residue linked through one oxygen of a monohydric, dihydric, trihydric, or tetrahydric alcohol or phenol having 1 to 40 carbon atoms; and when p is 1, 2, or 3 $R_6$ is a residue linked through two oxygens of a dihydric, trihydric, or tetrahydric alcohol or phenol having 2 to 40 carbon atoms.

**37**. A stabilized synthetic resin composition comprising a synthetic resin and 0.01 to 5% by weight of an ortho-alkylhydroxybenzylpropanediol compound according to claim **1**.

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**4,298,521**

## STABILIZED POLYOLEFIN COMPOSITIONS

**John L. H. Allan, Glen Rock; Arnold B. Finestone, Woodcliff Lake, both of N.J., and John J. Roderick, Avon Lake, Ohio, assignors to El Paso Polyolefins Company, Paramus, N.J.**

**Division of Ser. No. 705,303, Jul. 14, 1976, abandoned. This application Mar. 28, 1979, Ser. No. 24,500**

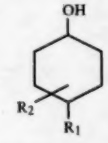
**Int. Cl.**[3] **C08L** *23/00, 61/20*

**U.S. Cl. 260—45.9 R** **21 Claims**

**1**. A mono-α-olefin polymer composition stabilized against copper-activated accelerated oxidative degradation, which comprises:

a mono-α-olefin polymer and from about 0.1 to about 10 percent by weight based on the total weight of the composition of a polymeric compound as the sole copper deactivating agent, which polymeric compound has been prepared by a process comprising

(a) reacting at least one para-substituted phenol of the formula:



wherein $R_1$ is a $C_3$–$C_{30}$ group selected from alkyl, cycloalkyl, alkaryl or aryl and $R_2$ is either hydrogen, a sulfonic acid group or a sulfonic acid salt group;

with an aldehyde or ketone of the formula:

wherein $R_3$ and $R_4$ independently from each other can be either hydrogen or a $C_1$–$C_{36}$ group selected from alkyl, cycloalkyl, alkaryl or aryl,

in a molar ratio of aldehyde or ketone to phenol of at least abcut 2:1 in the presence of an alkaline catalyst; and

(b) reacting the product of step (a) with ammonia, or an amine of the formula:

$$H(NR_6R_5)_nNR_6H$$

wherein $R_5$ is a $C_2$–$C_{20}$ group selected from alkylene, cycloalkylene, alkarylene or arylene, $R_6$ is hydrogen or a $C_1$–$C_{36}$ group selected from alkyl, cycloalkyl, alkaryl or aryl, and n is a number from 0 to 3,

in about a 1:1 molar ratio of ammonia or amine to the phenol used in step (a).

**4,298,522**

## DIPHENYLAMINE DERIVATIVES AND DEGRADATION INHIBITORS FOR RUBBER POLYMERS

**Mitsuhiro Tamura, Sagamihara; Tetsuo Ohishi, Tokyo, and Hiroshi Sakurai, Yokohama, all of Japan, assignors to Nippon Zeon Co. Ltd., Tokyo, Japan**

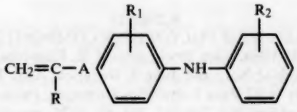
**Filed Jun. 19, 1980, Ser. No. 160,855**

**Claims priority, application Japan, Jun. 21, 1979, 54/78599; Jun. 21, 1979, 54/78600**

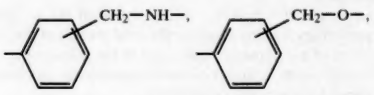
**Int. Cl.**[3] **C08K** *5/43, 5/18;* **C07C** *143/80, 87/58*

**U.S. Cl. 260—45.9 QB** **12 Claims**

**1**. A diphenylamine derivative which is capable of inhibiting degradation of reactive rubbery polymers, said derivative being of the general formula



wherein R represents a hydrogen atom or a methyl group, $R_1$ and $R_2$, independently from each other, represent a hydrogen atom, a chlorine atom, a bromine atom, or a hydrocarbon radical having 1 to 12 carbon atoms, and A represents



—$SO_2$—NH—, or —$CH_2$—$SO_2$—NH—.

**10**. A diene-type rubbery polymer composition comprising 100 parts by weight of a diene-type rubbery polymer and 0.01 to 10 parts by weight of the diphenylamine derivative of claim **1** as a degradation inhibitor.

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**4,298,523**

## METHODS AND COMPOSITIONS FOR PREPARATION OF H-ARG-X-Z-Y-TYR-R

**George Heavner, Flemington, N.J., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.**

**Filed Jun. 17, 1980, Ser. No. 160,241**

**Int. Cl.**[3] **C07C** *103/52*

**U.S. Cl. 260—112.5 R** **8 Claims**

**1**. The protected tetrapeptide of formula alpha-T-X-omega-U-Z-Y-TYR-R′, wherein:

R′ is OU or $NH_2$;

X is epsilon-T″-LYS and Y is VAL or X and Y are both SAR;

Z is ASP or GLU; and T and T″ are each a member selected from the group consisting of:

(a)

wherein $R_1$ is phenyl; tolyl; xylyl; adamantyl; allyl; beta-cyanoethyl; fluorenylmethyl; benzyl, benzyl wherein the phenyl ring is substituted with from one to three members selected from halo, nitro, loweralkyl, and loweralkoxy, diisopropylmethyl; diphenylmethyl; cyclohexyl; cyclopentyl; vinyl; t-butyl; t-amyl; dimethyltrifluoromethylmethyl; or dimethylbiphenylmethyl;

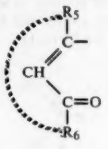
(b)

wherein $R_2$ is loweralkyl of two to four carbons or loweralkyl of one to four carbons substituted with from one to five halo groups;

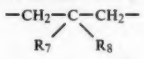
(c)

wherein V is S or O and $R_3$ and $R_1$ are each benzyl or loweralkyl;

(d)

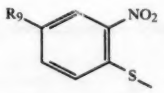


wherein $R_5$ and $R_6$ taken individually are each loweralkyl or $R_5$ and $R_6$ taken together is



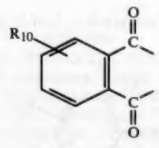
where $R_7$ and $R_8$ are each hydrogen or loweralkyl;

(e)



wherein $R_9$ is hydrogen or nitro; and

(f)



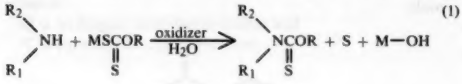
wherein $R_{10}$ is hydrogen, methyl, halo, or nitro provided that T is monodentate when X is SAR; and U is benzyl or benzyl in which the phenyl group is substituted with from one to three members each selected from halo, nitro, $C_1$–$C_3$ loweralkyl, and $C_1$–$C_3$ loweralkoxy.

## 4,298,524
## PREPARATION OF THION- AND THIOL-CARBAMIC ESTERS

Giancarlo Calcagno, Milan, Italy, assignor to Ligurchim S.r.l., Genoa, Italy

Filed Jan. 10, 1980, Ser. No. 111,109
Claims priority, application Italy, Aug. 6, 1979, 24940 A/79
Int. Cl.[3] C07C *155/02*; C07D *211/06*
U.S. Cl. 260—239 BF 15 Claims

1. Method for obtaining thion-carbamic esters, consisting in reacting in a single stage an alkaline xanthogenate, an amine and an oxidizer, according to the reaction:




(1)

wherein:

R is a lower alkyl; $R_1$,$R_2$ are lower alkyls, cycloparaffinic radicals or $R_1$ and $R_2$ together with the nitrogen to which they are attached form a heterocyclic ring;

and

is a xanthogenate, wherein M is a metal.

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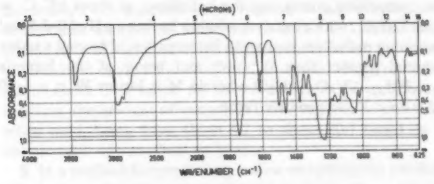
## 4,298,525
## BIS-INDOLE-ALKALOID

Karola Jovanovics, and Sandor Görög, both of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar RT, Budapest, Hungary

Filed Jul. 27, 1979, Ser. No. 61,353
Claims priority, application Hungary, Apr. 23, 1979, RI-708
Int. Cl.[3] C07D *519/04*
U.S. Cl. 260—244.4 1 Claim

Enclosure 1.
RGH-4451- infrared spectrum




1. A compound RGH-4451 or a pharmaceutically acceptable acid addition salt thereof wherein the compound RGH-4451 has the following characteristics:

melts at 235° C. to 238° C.,

has a specific rotary power of $[\alpha]_D^{25} = +30.5°$, (c = 1, chloroform),

has an infrared spectrum illustrated in FIG. 1,

has a $^1$H-NMR spectrum illustrated in FIG. 2,

has a $^{13}$C-NMR spectrum illustrated in FIG. 3, and

has a molecular weight of 854.449

indicating that RGH-4451 differs from vinblastine in containing a N—$CH_2$—O—$C_2H_5$ group in place of an N-methyl group in the vindoline moiety of the molecule.

## 4,298,526
## PREPARATION OF EASILY DISPERSIBLE AND DEEPLY COLORED PIGMENTARY FORMS

Reinhard Sappok, Heidelberg; Fritz Guellich, Dannstadt-Schauernheim; Karl Roth, Limburgerhof, and Alois Wiesenberger, Lambsheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Nov. 16, 1979, Ser. No. 94,984
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1978, 2851752
Int. Cl.[3] C09B *47/04*
U.S. Cl. 260—314.5 9 Claims

1. In a process for the preparation of an easily dispersible and deeply colored pigmentary form of a phthalocyanine selected from the group consisting of metal-free phthalocyanine, metalized phthalocyanines containing up to 2 chlorine or bromine atoms in the molecule, and polyhalophthalocyanines, by comminuting the crude pigment under shearing stress and impact stress in the absence of milling assistants, converting the milled material to a pigmentary form by recrystallization in organic solvent, and isolating the pigment, the improvement which comprises comminuting the crude pigment in the presence of from 0.5 to 15 percent by weight, based on crude pigment, of one or more acids which have a pK of $<4.9$ and are non-oxidizing under the milling conditions until the primary particle size is not greater than 0.1 μm.

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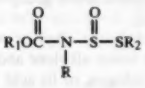
## 4,298,527
## N-ALKYLTHIO- AND N-ARYLTHIOSULFINYLCARBAMATE ESTERS

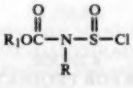
Mohamed A. H. Fahmy, and Tetsuo R. Fukuto, both of Riverside, Calif., assignors to The Regents of the University of California, Los Angeles, Calif.

Division of Ser. No. 18,417, Mar. 7, 1979, Pat. No. 4,262,015.
This application Oct. 6, 1980, Ser. No. 194,757
Int. Cl.[3] C07D *317/44*
U.S. Cl. 260—340.5 R 14 Claims

1. A method for the preparation of carbamates of the formula:




which comprises reacting a compound of the formula




with a compound of the formula $R_2SH$ wherein R is a hydrocarbyl group containing from 1 to 12 carbon atoms; $R_1$ is selected from the group consisting of a hydrocarbyl group containing from 1 to 20 carbon atoms, a 5 to 6 membered heterocyclic ring containing O or S atoms, and the >C=N— group; and $R_2$ is a hydrocarbyl group containing from 1 to 20 carbon atoms.

12. The method as defined in claim 1, wherein $R_1$ is a benzofuranyl or a 1,3-benzodioxolyl group.

**4,298,528**

## CYCLOHEXYL-DIOXANE LIQUID CRYSTALLINE COMPOUNDS

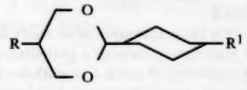
**Nicholas L. Sethofer, San Jose, Calif., assignor to Timex Corporation, Waterbury, Conn.**

**Filed Mar. 28, 1980, Ser. No. 135,381**

**Int. Cl.³ C07D *319/04***

**U.S. Cl. 260—340.7** **5 Claims**

1. An elongated, rod-shaped liquid crystalline compound of the formula:



where R and $R^1$ can be the same or different straight chain alkyl or alkoxy group.

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**4,298,529**

## ALKOXYIMINO DIOXY BUTYRIC ACID DERIVATIVES

**Ikuo Ueda, Toyonaka; Takao Takaya, Kawanishi; Masakazu Kobayashi, Ikeda; Takashi Masugi, Kiltamachi; Hisashi Takasugi, Kohamanishi; Hiromu Kochi, Sakai, and Tadashi Kitaguchi, Kukuchinishimachi, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan**

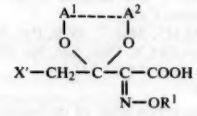
**Continuation-in-part of Ser. No. 73,565, Sep. 7, 1979, abandoned. This application Dec. 10, 1979, Ser. No. 101,527**

**Claims priority, application Japan, Sep. 12, 1978, 53-112555; United Kingdom, Sep. 12, 1978, 36564/78; Japan, Jan. 12, 1979, 54-3106; United Kingdom, Sep. 12, 1978, 36564/78; Feb. 19, 1979, 5791/79**

**Int. Cl.³ C07D *317/28***

**U.S. Cl. 260—340.9 R** **7 Claims**

1. A new compound of the formula:



(I)

wherein

$R^1$ is an aliphatic hydrocarbon group which may have suitable substituent(s),

$A^1$ and $A^2$ are each lower alkyl or $A^1$ and $A^2$ are linked together to form lower alkylene and

X' is hydrogen or halogen, or its acid halide or its salt.

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**4,298,530**

## PROCESS FOR PRODUCTION OF 3-HYDROXY-3-METHYLPHTHALIDE OR THE NUCLEARLY SUBSTITUTED DERIVATIVES THEREOF

**Hirokazu Iwasaki, Kawasaki, and Hideo Takahashi, Ebina, both of Japan, assignors to Showa Denko K.K., Tokyo, Japan**

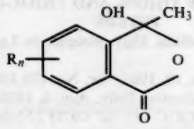
**Filed Jun. 2, 1980, Ser. No. 155,083**

**Claims priority, application Japan, Jun. 6, 1979, 54-70153**

**Int. Cl.³ C07D *307/88***

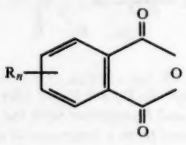
**U.S. Cl. 260—343.3 R** **8 Claims**

1. In the process for producing 3-hydroxy-3-methylphthalide or its nuclearly substituted derivative of the formula



(II)

wherein R represents a lower alkyl group, a lower alkoxy group, a lower alkoxycarbonyl group or a carboxyl group, and n is O or an integer of 1 to 3, by the reaction of phthalic anhydride or its nuclearly substituted derivative of the formula



wherein R and n are as defined,

with malonic acid at a temperature of 60° to 130° C., the improvement according to which the reaction is carried out in at least one solvent selected from the group consisting of dialkylformamides, dialkylsulfoxides and aliphatic lower carboxylic acids in the presence of, as a catalyst, a salt of an inorganic or organic acid with a metal selected from the group consisting of metals of Groups IA, IIA, IIIB and VIII of the periodic table, manganese, copper and zinc.

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**4,298,531**

## OXIDATION OF BUTADIENE TO FURAN

**Richard V. Lindsey, Jr., and William W. Prichard, both of Hockessin, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Continuation-in-part of Ser. No. 108,820, Dec. 31, 1979, abandoned. This application Dec. 15, 1980, Ser. No. 215,711**

**Int. Cl.³ C07D *307/36***

**U.S. Cl. 260—346.11** **15 Claims**

1. Process for preparing furan from 1,3-butadiene, the process comprising contacting the butadiene, at about 65° C. to about 120° C., with a catalyst solution having a pH of 0–2.5 and containing palladium ions and a heteropolyacid having a redox potential greater than 0.5 volt and being of the formula $H_{3+n}PM_{12-n}V_nO_{40}\cdot xH_2O$ wherein M is Mo or W, n is 1–10 and $0<x<32$, to produce furan.

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**4,298,532**

## 3-NAPHTHYL BENZOFURANS

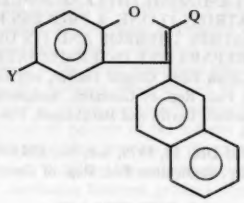
**Robert A. Scherrer, White Bear Lake, and Richard M. Stern, Cottage Grous, both of Minn., assignors to Riker Laboratories, Inc., Northridge, Calif.**

**Division of Ser. No. 17,590, Mar. 5, 1979, abandoned, which is a division of Ser. No. 943,690, Sep. 19, 1978, Pat. No. 4,154,848, which is a division of Ser. No. 861,893, Dec. 19, 1977, Pat. No. 4,128,659. This application Jan. 21, 1980, Ser. No. 113,644**

**Int. Cl.³ C07D *307/78, 307/79***

**U.S. Cl. 260—346.22** **2 Claims**

1. A compound of the formula



wherein
Q is hydrogen, bromine or iodine and
Y is carboxyl or carboxymethyl.

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**4,298,533**

## PRODUCTION OF MALEIC ANHYDRIDE

**Koji Moriya, and Itsuo Furuoya, both of Osaka, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan**

**Division of Ser. No. 560,802, Mar. 21, 1975, Pat. No. 4,108,874. This application Jun. 13, 1978, Ser. No. 915,301**

**Claims priority, application Japan, Apr. 9, 1974, 49-40566; May 22, 1974, 49-58117**

**Int. Cl.³ C07D *307/60***

**U.S. Cl. 260—346.75** **5 Claims**

**1.** In a method for producing maleic anhydride by oxidation of a hydrocarbon having not less than four carbon atoms in gaseous phase in the presence of a catalyst, the improvement wherein the catalyst comprises (a) vanadium oxide, (b) phosphorus oxide, (c) an alkaline earth metal oxide selected from the group consisting of beryllium oxide, strontium oxide and barium oxide, and (d) thallium oxide, said catalyst optionally further containing (e) iron oxide, the amount of vanadium oxide relative to phosphorus oxide being from about 1:1 to about 1:5 based on the atomic ratio of vanadium to phosphorus, the amount of vanadium oxide relative to said alkaline earth metal oxide being from about 1:5 to about 15:1 based on the atomic ratio of vandium to the alkaline earth metal, the amount of vanadium oxide relative to thallium oxide being from about 1:2 to about 20:1 based on the atomic ratio of vanadium to thallium, the amount of vanadium oxide relative to iron oxide, when used, being from about 1:2 to about 20:1 based on the atomic ratio of vanadium to iron.

**5.** In a method for producing maleic anhydride by oxidation of a hydrocarbon having not less than four carbon atoms in gaseous phase in the presence of a catalyst, the improvement wherein the catalyst consists essentially of (a) vanadium oxide, (b) phosphorus oxide, (c) an alkaline earth metal oxide selected from the group consisting of beryllium oxide, strontium oxide and barium oxide, and (d) iron oxide, the amount of vanadium oxide relative to phosphorus oxide being from about 1:1 to about 1:5 based on the atomic ratio of vandium to phosphorus, the amount of vanadium oxide relative to said alkaline earth metal oxide being from about 1:5 to about 15:1 based on the atomic ratio of vanadium to the alkaline earth metal, the amount of vanadium oxide relative to iron oxide being from about 1:2 to about 20:1 based on the atomic ratio of vanadium to iron.

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**4,298,534**

## PREPARATION OF BRILLIANT, TRANSPARENT PIGMENTARY BROMO-ISOVIOLANTHRONE OF HIGH TINCTORIAL STRENGTH

**Helmut Hoch, Wachenheim; Erwin Hahn, Heidelberg, and Heinrich Hiller, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany**

**Filed Mar. 4, 1980, Ser. No. 127,148**

**Claims priority, application Fed. Rep. of Germany, Mar. 12, 1979, 2909568**

**Int. Cl.³ C09B *3/22***

**U.S. Cl. 260—358** **11 Claims**

**1.** A process for the preparation of a bromoisoviolanthrone pigment, in the α-modification, having high tinctorial strength, comprising: oxidizing leuco-bromoisoviolanthrone suspended in an aqueous alkaline medium containing a surfactant at a temperature of 10° to 100° C. while subjecting said leuco-bromoisoviolanthrone to shearing forces; and isolating the oxidized pigment.

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**4,298,535**

## ANTHRACYCLINONES

**Pierre Vogel, and Pierre-Alain Carrupt, both of Lausanne, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.**

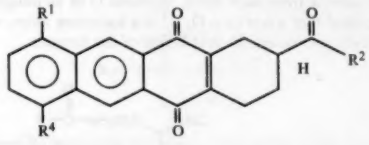
**Division of Ser. No. 139,532, Apr. 11, 1980, Pat. No. 4,264,510. This application Oct. 20, 1980, Ser. No. 198,498**

**Claims priority, application Switzerland, Apr. 20, 1979, 3751/79; Jan. 31, 1980, 783/80**

**Int. Cl.³ C07C *50/16, 69/76, 50/22, 69/74***

**U.S. Cl. 260—365** **7 Claims**

**1.** A compound of the formula



wherein $R^1$ represents a hydrogen atom or a hydroxy or methoxy group, $R^2$ represents a methyl or lower alkoxy group and $R^4$ represents a hydrogen atom or a hydroxy, methoxy or benzyloxy group with the proviso that $R^1$ and $R^4$ do not simultaneously represent a hydrogen atom.

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**4,298,536**

## PROCESS FOR THE MANUFACTURE OF 1,2-DIAMINOANTHRAQUINONE

**Athanassios Tzikas, Pratteln, Switzerland, assignor to Ciba-Geigy Ag, Basel, Switzerland**

**Filed Apr. 26, 1979, Ser. No. 33,404**

**Claims priority, application Switzerland, Apr. 28, 1978, 46508/78**

**Int. Cl.³ C07C *97/24***

**U.S. Cl. 260—378** **7 Claims**

**1.** A process for the manufacture of 1,2-diaminoanthraquinone, which comprises reacting 1-nitro-2-acetylaminoanthraquinone with hydrazine or hydroxylamine, or with derivatives thereof, in protic solvents.

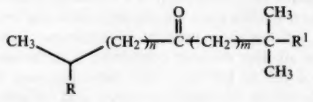
## 4,298,537

## PROCESS FOR PRODUCING STEROID COMPOUNDS HAVING AN OXO GROUP IN THE SIDE CHAIN

Osamu Nishikawa; Kenji Ishimaru, both of Iwakuni; Toru Takeshita, Hino, and Hideki Tsuruta, Iwakuni, all of Japan, assignors to Teijin Limited, Osaka, Japan

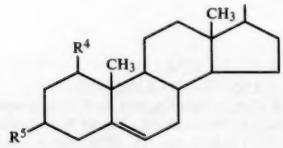
Filed Nov. 28, 1979, Ser. No. 97,980
Claims priority, application Japan, Nov. 30, 1978, 53-147232
Int. Cl.[3] C07J 9/00
U.S. Cl. 260—397.2 13 Claims

1. A process for producing a steriod compound having an oxo group in the side chain and expressed by the formula



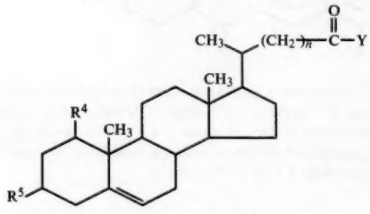
[I]

wherein R represents a steroid skeleton expressed by the following formula



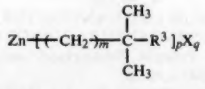
(a)

wherein $R^4$ represents a hydrogen atom or a protected hydroxyl group, $R^5$ represents a protected hydroxyl group, or a steroid skeleton having a hydroxyl group or groups derived from a steroid skeleton of above formula (a) by means of hydrolysis, $R^1$ represents a hydrogen atom, a hydroxyl group or a hydroxyl group protected as an ether group, and n and m, independently from each other, represent O or an integer 1 to 4, provided that when m is O, $R^1$ is a hydrogen atom, which comprises condensing an acid halide of the formula



[III]

wherein $R^4$, $R^5$ and n are as defined above, and Y represents a halogen atom,
with an organozinc compound of the formula



[II]

wherein $R^3$ represents a hydrogen atom or a hydroxyl group protected as an ether group, p is 1 or 2 and q is 0 or 1 provided that p+q=2, X represents a helogen atom, and m is as defined above,
in an inert organic medium in the presence of a catalytic amount of an ether capable of forming a complex with the organozinc compound, and optionally, hydrolyzing the resulting product.

## 4,298,538

## 16-DIMETHYLAMINOMETHYLENE-3-METHOXY-1,3,5-(10)-ESTRATRIEN-17-ONE, A PROCESS FOR THE PREPARATION THEREOF AND ITS USE AS A PREPARATIVE INTERMEDIATE

Günter Neef; Ulrich Eder; Gregor Haffer, and Gerhard Sauer, all of Berlin, Fed. Rep. of Germany, assignors to Schering, Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Dec. 18, 1979, Ser. No. 104,949
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1978, 2856578
Int. Cl.[3] C07J 1/00
U.S. Cl. 260—397.4 5 Claims

1. A process for preparing a 16-ethylidene steroid which comprises reacting the corresponding 16-dimethylaminomethylene steroid with a methyl Grignard reagent.

## 4,298,539

## PROCESS FOR THE ISOLATION OF β-SITOSTEROL

Lasse A. Koskenniska, Oulu, Finland, assignor to Farmos-Yhtma OY, Turku, Finland

Filed Oct. 30, 1980, Ser. No. 202,068
Claims priority, application Finland, Nov. 19, 1979, 793612
Int. Cl.[3] C07J 9/00
U.S. Cl. 260—397.25 8 Claims

1. A method for the isolation of β-sitosterol essentially free of α-sitostërol from a mixture containing both α- and β-sitosterol by treating the said mixture with a mixture of organic solvents and water wherein

(a) the solvent mixture is added to the β-sitosterol containing starting material so that the weight ratio of β-sitosterol containing starting material: solvent mixture is 1:2–1:30, and the solvent mixture consists of

a hydrocarbon selected from the class consisting of a single aromatic hydrocarbon and a mixture of an aromatic and an aliphatic hydrocarbon, in an amount of 10–99%,

a polar organic solvent, 1–90% water, at least in an amount necessary to saturate the hydrocarbon layer

(b) the mixture is warmed until the β-sitosterol containing starting material is dissolved

(c) the product is precipitated,

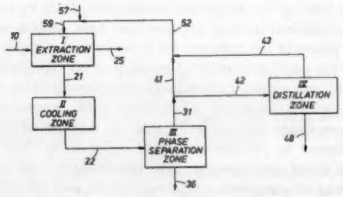
(d) the precipitate, which is essentially free of α-sitosterol is separated from the mother liquor by filtration.

## 4,298,540

## PROCESS FOR OILSEED EXTRACTION WITH AN ISOPROPANOL-BASED SOLVENT

Kun C. Youn, and Dale J. Wilpers, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 15, 1980, Ser. No. 216,418
Int. Cl.[3] A23J 1/14
U.S. Cl. 260—412.4 5 Claims




1. In the process for the recovery of oils from seeds containing extractable oils, comprising steps for contacting seeds having a water content of between about 9 and 13 percent by weight with an isopropanol-based extraction solvent in an

extraction zone to obtain an extract of desired seedoils in the solvent, cooling the extract, and phase-separating the cooled extract into a lower liquid oil phase which is rich in seedoils and an upper liquid solvent phase containing recovered solvent, the improvement which comprises dividing the recovered solvent phase of the phase separation into a first division fraction comprising between about 60 and 95 percent of the solvent phase and a second division fraction comprising between about 5 and 40 percent of the solvent phase, directly recycling said first division fraction to the extraction zone as extraction solvent, distilling the second division fraction to yield a liquid distillation bottoms product comprising water and free fatty acids and a vapor distillation overhead product consisting essentially of a constant boiling mixture of isopropyl alcohol and water, condensing said vapor overhead to a liquid distillation overhead product, and recycling said liquid distillation overhead product to the extraction zone as extraction solvent.

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**4,298,541**

## TRIHYDROCARBYL SILYL-SUBSTITUTED ALKYL DIARYL PHOSPHINE TRANSITION METAL COMPLEXES AND THEIR USE AS HOMOGENEOUS CATALYSTS

**Alexis A. Oswald, Mountainside, N.J.; Torris G. Jermansen, Staten Island, N.Y.; Andrew A. Westner, Paramus, and I-Der Huang, West Paterson, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.**

**Filed Feb. 12, 1979, Ser. No. 11,238**

**Int. Cl.³ C07F *15/00***

**U.S. Cl. 260—429 R** **25 Claims**

1. Complexes of the formula:

$$[(Ar_2PQ)_yMR_{4-y}]_g(MX_n)_s$$

wherein Ar is selected from phenyl and mono-, di- or trisubstituted phenyl, said substituents being selected from the group consisting of fluorine, methyl and acetyl; Q is selected from xylylene and a $C_2$–$C_{14}$ straight chain alkylene divalent radical; R is a $C_1$ to $C_6$ hydrocarbyl radical selected from the group consisting of $C_1$ to $C_6$ alkyl, $C_5$ and $C_6$ cycloalkyl, and phenyl; M is a Group VIII transition metal selected from the group consisting of Co, Rh, Ir, Ru,; X is an anion or organic ligand, excluding halogen, satisfying the coordination sites of the metal; y is 1 to 4; g is 1 to 6 with the proviso that g times y is 1 to 6; n is 2 to 6; and s is 1 to 3.

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**4,298,542**

## NEOPHYL MANGANESE CHLORIDE

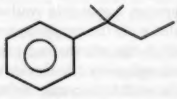
**Takao Yoshida, West Long Branch, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.**

**Filed Sep. 18, 1980, Ser. No. 188,563**

**Int. Cl.³ C07F *3/02***

**U.S. Cl. 260—429 R** **1 Claim**

1. The organometallic compound having the structure:




**4,298,543**

## SILOXANE-TIN COATINGS

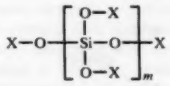
**Gabriel H. Law, Whittier, and Albert P. Gysegem, Monrovia, both of Calif., assignors to Ameron, Inc., Monterey Park, Calif.**

**Division of Ser. No. 858,708, Dec. 8, 1977, Pat. No. 4,227,929, which is a division of Ser. No. 718,149, Aug. 26, 1976, Pat. No. 4,080,190. This application Feb. 19, 1980, Ser. No. 122,199**

**Int. Cl.³ C07F *7/22***

**U.S. Cl. 260—429.7** **4 Claims**

1. A method for preparing a precursor having the formula:



where m is from about 1 to about 10,

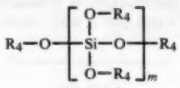
where each X is independently selected from the group consisting of alkyl and alkoxyalkyl radicals containing less than about 6 carbon atoms and Y,

where each Y in the precursor is independently a trisubstituted tin radical having the formula:

where $R_1$, $R_2$, and $R_3$ are independently selected from the group consisting of alkyl, cycloalkyl, and aryl radicals, where $R_1$, $R_2$, and $R_3$ contain in combination up to 18 carbon atoms, and

where the X's are selected so the ratio of tin atoms to silicon atoms in the precursor is from about 1:50 to (2m+2):m;

the method comprising the steps of combining a silicate having the formula:



where $R_4$ represents the group consisting of alkyl and alkoxyalkyl radicals containing less than about 6 carbon atoms, with about n/2 moles of water per mole of the silicate and about n/2 moles of bis-trisubstituted tin oxide having the formula Y-O-Y per mole of the silicate, where the ratio of n to m equals the ratio of tin atoms to silicon atoms in the precursor; and

maintaining the temperature at which the silicate, tin oxide, and water are combined below the temperature at which the precursor decomposes.

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**4,298,544**

## MANUFACTURING PROCESS FOR PREPARING DISUBSTITUTED (N-CYANOIMIDO) CARBONATES

**Graham E. Robinson, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England**

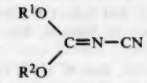
**Filed Jan. 24, 1980, Ser. No. 118,066**

**Claims priority, application United Kingdom, Jan. 26, 1979, 79/02931; Jan. 26, 1979, 79/02932**

**Int. Cl.³ C07C *125/08*; C07D *319/04, 317/10***

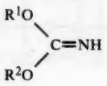
**U.S. Cl. 260—453 RW** **10 Claims**

1. A process for the manufacture of a disubstituted (N-cyanoimido)carbonate of the formula:



I

in which $R^1$ and $R^2$ are the same and are alkyl radicals of 1 to 6 carbon atoms or phenyl radicals, or $R^1$ and $R^2$ are joined to form an ethylene or propylene chain which is optionally substituted by 1 or 2 alkyl radicals each of 1 to 3 carbon atoms, by reaction of a disubstituted imidocarbonate of the formula:

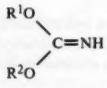


II

with cyanamide, characterised in that the reaction is conducted in a two phase system containing water and a water-immiscible organic solvent.

6. A process as claimed in claim 1 in which the starting material of the formula II is manufactured in situ by treatment of cyanogen chloride or cyanogen bromide with the appropriate alcohol or diol in a two phase system containing water and a water-immiscible organic solvent.

10. A process for the manufacture of a disubstituted imidocarbonate of the formula:



II

in which $R^1$ and $R^2$ are the same and are methyl or ethyl, or $R^1$ and $R^2$ are joined to form an ethylene or propylene chain which is optionally substituted by 1 or 2 alkyl radicals each of 1 to 3 carbon atoms, by reaction of cyanogen chloride or cyanogen bromide with the appropriate alcohol or diol, characterised in that the reaction is conducted in a two phase system containing water and a water-immiscible organic solvent.

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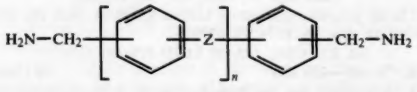
**4,298,545**

## PROCESS FOR PRODUCING PHTHALONITRILE

**Masao Saito; Motoyuki Hosokawa; Takamasa Kawakami, and Yuko Murayama, all of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan**

**Filed Apr. 3, 1980, Ser. No. 136,989**
**Claims priority, application Japan, Apr. 3, 1979, 54-39919**
**Int. Cl.³ C07C *121/56***
**U.S. Cl. 260—465 H** **12 Claims**

1. A process for producing phthalonitrile, which comprises contacting a xylylenediamine condensate with an oxide catalyst in the presence of a molecular oxygen-containing gas at a reaction temperature of 250°–600° C., said oxide catalyst being a catalyst of (1) silica or alumina, or (2) silica or alumina containing (a) vanadium oxide and at least one metal oxide selected from the group consisting of oxides of chromium, molybdenum, tungsten, bismuth, manganese, antimony, iron, boron, phosphorus, tellurium, and titanium, and said xylylenediamine condensate being a meta or paraxylylene diamine condensate represented by the formula:



wherein Z is —CH=N—$CH_2$— or —$CH_2$—NH—$CH_2$— and n is an integer of 1 or more, or a mixture of the meta and paraxylylenediamine condensates.

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**4,298,546**

## ISOMERIZATION OF 2-METHYL-3-BUTENENITRILE

**Robert N. McGill, Orange, Tex., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed Aug. 5, 1980, Ser. No. 175,398**
**Int. Cl.³ C07C *121/30***
**U.S. Cl. 260—465.9** **3 Claims**

1. In a process for the isomerization of 2-methyl-3-butenenitrile to linear pentenenitriles in the presence of a catalyst comprising a zero-valent nickel complexed with an organophosphorus compound, the improvement which comprises conducting said isomerization in the presence of at least 0.05% by weight based upon the weight of the reactants of butadiene.

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**4,298,547**

## PREPARATION OF IMPROVED ALKYLPHENYLSULFONATES

**Lewis B. Young, Skillman, N.J., assignor to Mobil Oil Corporation, New York, N.Y.**

**Division of Ser. No. 61,222, Jul. 27, 1979, Pat. No. 4,234,751.**
**This application Aug. 8, 1980, Ser. No. 176,367**
**Int. Cl.³ C07C *143/24***
**U.S. Cl. 260—505 A** **8 Claims**

1. In the process for making alkylbenzene sulfonate compounds comprising:

(A) alkylation of aromatic compounds to produce alkylbenzene compounds wherein the alkyl group has between about 6 and about 20 carbon atoms therein, followed by

(B) sulfonation of the alkylbenzene compounds to produce the alkylphenylsulfonate derivative thereof;

the improvement comprising selective production of alkylphenylsulfonates having reduced proportion of the 2-alkylphenylsulfonate isomer thereof; said improvement resulting from contact of the isomeric mixture of alkylbenzene compounds produced in Step (A) above, prior to carrying out Step (B) above, with a crystalline zeolite catalyst, having a constraint index of about 1 to 12 and a silica to alumina mole ratio of at least 12, at a temperature of between about 150° C. and 550° C. and a pressure of between about $10^4 N/m^2$ and $10^6 N/m^2$.

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**4,298,548**

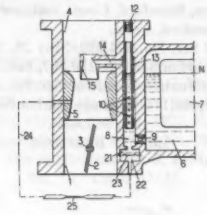
## CARBURETORS FOR INTERNAL COMBUSTION ENGINES

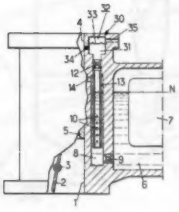
**Michael Pontoppidan, Chatou, France, assignor to S.I.B.E. Societe Industrielle de Brevets et d'Etudes, Neuilly sur Seine, France**

**Filed May 2, 1980, Ser. No. 146,158**
**Claims priority, application France, May 11, 1979, 79 12124**
**Int. Cl.³ F02M *7/12***
**U.S. Cl. 261—34 R** **5 Claims**

1. A carburetor for an internal combustion engine comprising a fuel jet system opening into the intake pipe of the engine and comprising an emulsion well, an air path of invariable flow area for supplying atmospheric air to said wall, jetting means for supplying fuel to said well, and a device for correcting the fuel/air ratio of the mixture supplied to the engine as a function of the amplitude of the alternating pressure variations caused by the suction of the engine in the intake pipe, wherein the correcting device comprises a movable wall defining a chamber which communicates with the emulsion well and attenuating means through which the alternating pressure variations are applied to said well, whereby the device controls the depression in the emulsion well to increase or reduce the amplitude of the alternating component of the pressure which is

communicated thereto from the opening of the fuel jet system, according to whether the acoustic matching of the carburetor-





engine manifold assembly tends to produce for high charges of the engine an excessive or insufficient fuel/air ratio.

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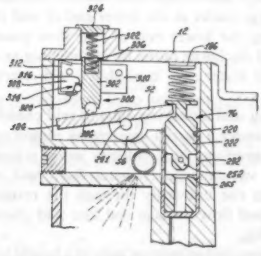
**4,298,549**
**CARBURETOR**
**Albert H. Woodworth, Carlsbad, Calif., assignor to Woodworth Carburetor Corp. of Nevada, Carlsbad, Calif.**
**Filed Oct. 29, 1979, Ser. No. 88,944**
**Int. Cl.³ F02M 7/22**
**U.S. Cl. 261—39 B** **11 Claims**



**1.** In an air valve carburetor having a throat, a throttle valve at the exit of the throat, an air valve at the entrance of the throat, a vacuum responsive actuator for driving said air valve in response to the vacuum pressure in the throat, a fuel nozzle disposed in the throat, a fuel reservoir and a fuel supply valve interconnected between the fuel reservoir and the fuel nozzle, means for interconnecting said fuel supply valve with said air valve, comprising:

a chamber in the housing of said carburetor disposed to contain said fuel supply valve;

a shaft interconnected with said air valve and rotatable upon adjustment of said valve, said shaft having an end projecting into said chamber;

a cam surface on the end of said shaft;

a cam follower disposed for engagement and movement by said cam surface upon rotation of said shaft, said cam follower being an elongated member with an anchor end and an action end and being disposed for engagement by said shaft intermediate said ends;

adjustable anchor means operatively associated with the anchor end of said cam follower, said anchor means being disposed to engage and hold said anchor end of said cam follower in a fulcrum position and being adjustable to change said fulcrum position; and

interconnection means on the action end of said cam follower interconnecting said action end with the fuel supply valve for regulation of said fuel supply valve in response to rotation of said shaft and cam surface;

said adjustable anchor means including a fulcrum shaft reciprocally movable vertically in said housing with a lower end disposed in contact with said cam follower, resilient means operatively associated with an upper end of said shaft and disposed to urge said shaft downwardly, and one-way lock means disposed operatively associated with said fulcrum shaft and disposed to permit downward movement thereof and prevent upward movement thereof.

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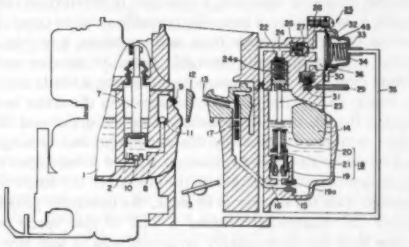
**4,298,550**
**CARBURETOR**
**Kenji Hayashi, Aichi, Japan, assignor to Aisan Industry Co., Ltd., Aichi, Japan**
**Filed Jan. 24, 1980, Ser. No. 114,794**
**Claims priority, application Japan, Jan. 29, 1979, 54/9568**
**Int. Cl.³ F02M 7/20**
**U.S. Cl. 261—69 R** **16 Claims**



**1.** A carburetor having a suction pipe, comprising

a main fuel passage,

a fuel adding passage adapted for adding fuel and disposed in said main fuel passage,

a fuel adding valve means disposed in said fuel adding passage for opening and closing the latter, said fuel adding valve means including an auxiliary jet valve and a spring means for biasing said auxiliary jet valve in a direction of closing said fuel adding passage,

piston means for being biased by a biasing force in a direction for engaging said valve means,

means defining a piston chamber, said piston means is disposed in said piston chamber,

means comprising a negative pressure passage communicating with said suction pipe and connected to one end of said piston chamber for introducing intake negative pressure such that a force generated by said negative pressure acts in a direction against the biasing force acting on said piston means,

another valve means for communicating therethrough said one end of said piston chamber with atmospheric pressure,

diaphragm means for actuating said another valve means and defining a negative pressure chamber, and

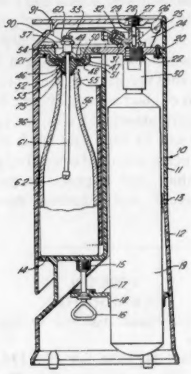
an intake negative pressure introduction passage communicating with said suction pipe and leading to said negative pressure chamber of said diaphragm means.

**4,298,551**

## APPLIANCE FOR MAKING AN AERATED BEVERAGE

**Rune F. R. Adolfsson, Stockholm, and Dietrich W. Gellert, Ekero, both of Sweden, assignors to Thorn Svenska A.B., Solna, Sweden**

**Filed Aug. 2, 1979, Ser. No. 62,943**
**Int. Cl.³ B01F *3/04***
**U.S. Cl. 261—121 R** **11 Claims**



**1**. An appliance for making an aerated beverage comprising a casing, means for mounting a container of pressurized carbon dioxide in said casing, a manually operable valve to control the outflow of carbon dioxide from said container, a nozzle connected to said manually operable valve to receive carbon dioxide from said valve, means for mounting a bottle containing water, so that the nozzle is immersed in the water in said bottle, a flexible diaphragm surrounding the upper end of the nozzle, a stopper carried by the diaphragm and closing the neck of the bottle when so mounted, a space formed above the diaphragm communicating with the interior of the bottle when mounted with the stopper in its neck, the upwardly projected area of the diaphragm forming a wall of said space being greater than the downwardly projected area of said stopper, whereby the pressure of the carbon dioxide urges the stopper into engagement with the neck of the bottle, and an overpressure safety valve communicating with the space above the diaphragm.

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**4,298,552**

## SOLVENTLESS EXTRUSION OF DOUBLE BASE PROPELLANT PREPARED BY A SLURRY PROCESS

**John R. Gimler, Succasunna, N.J., assignor to Hercules Incorporated, Wilmington, Del.**

**Filed Apr. 29, 1968, Ser. No. 72[illegible],588**
**Int. Cl.³ C06B *21/00***
**U.S. Cl. 264—3 B** **12 Claims**

**1**. A process for preparing double base propellant charges comprising:

(a) preparing a pourable slurry comprised of nitrocellulose propellant and a liquid plasticizer for the nitrocellulose propellant,

(b) casting the slurry into molds,

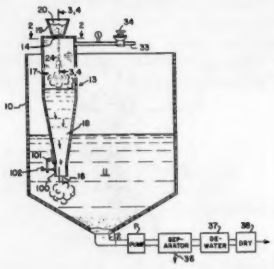
(c) curing the cast slurry into a solid mass, and (d) extruding the solid mass into a small propellant charges.

**4,298,553**

## METHOD OF PRODUCING LOW OXIDE METAL POWDERS

**Maurice D. Ayers, Stamford, Conn., assignor to Metal Innovations, Inc., Stamford, Conn.**

**Continuation of Ser. No. 474,210, May 29, 1974, abandoned, Continuation-in-part of Ser. No. 229,307, Feb. 25, 1972, Pat. No. 3,814,558, Continuation-in-part of Ser. No. 855,096, Sep. 4, 1969, Pat. No. 3,646,176. This application Nov. 20, 1978, Ser. No. 962,488**
**Int. Cl.³ B01J *2/06***
**U.S. Cl. 264—11** **10 Claims**



**1**. The method of atomizing molten metal which comprises the steps of

(a) directing a stream of molten metal downwardly into an enclosed, sealed, partially evacuated chamber through a restricted top opening formed in said chamber,

(b) impinging upon said stream of molten metal in an atomizing zone within said chamber high velocity jets of water at high pressure in two or more stages, including a first stage comprising a pair of thin, flat-shaped jets which atomize the metal stream and convert the metal stream into fine particles co-mingled with said water,

(c) guiding and confining the co-mingled water and metal particles directly downward through a flow passage of gradually decreasing cross section including a restricted discharge outlet at the lower end of said flow passage,

(d) sealing the lower end of said flow passage at said restricted discharge outlet by maintaining an open, confined body of water at a level above said restricted discharge outlet,

(e) causing said atomizing zone of said chamber to be maintained under a partial vacuum by reason of the discharge thereinto of said high velocity jets of water whereby said partial vacuum causes water from said open, confined body to rise upwardly through the restricted discharge outlet and flow passage and into said chamber to form a water leg,

(f) arranging said atomizing zone at a height in relation to the surface level of said open, confined body of water which is less than the height of said water leg required to equalize the partial vacuum in said atomizing zone,

(g) directing said high velocity jets of water in a generally downward direction directly toward said restricted discharge outlet with sufficient force and velocity whereby the water jets force the co-mingled water and metal particles downward and through the restricted discharge outlet with sufficient force and velocity to balance and largely offset the suction force created by the partial vacuum in said atomizing zone to establish the level of water in said water leg below the atomizing zone,

(h) discharging the downwardly flowing co-mingled water and metal particles through the restricted discharge outlet and into the open, confined body of water, and

(i) conducting steps (b), (c) and (h) in rapid sequence to achieve rapid quenching and cooling of the atomized

particles to a temperature sufficiently low to avoid oxidation of the metal particles.

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**4,298,554**

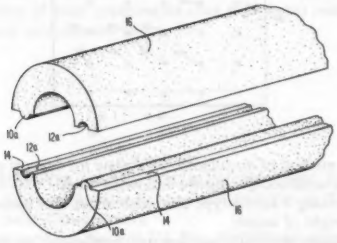
## COHERENT RIGID SOLID MATERIAL

**Edward G. Vogel, Lebanon, and Rodney C. Westlund, Lansdale, both of Pa., assignors to Lebanon Steel Foundry, Lebanon, Pa.**

**Division of Ser. No. 851,407, Nov. 14, 1977, Pat. No. 4,138,268, which is a continuation-in-part of Ser. No. 782,950, Mar. 30, 1977, abandoned. This application Jul. 3, 1978, Ser. No. 921,595**

**Int. Cl.³ C04B *35/16***

**U.S. Cl. 264—25** **26 Claims**



**1**. A process of making a coherent rigid solid material comprising the steps of mixing materials in the following parts by weight:

expanded perlite 20 through 50 parts;

sodium silicate or potassium silicate including 9.5 through 19 parts solids content of sodium silicate itself;

zinc oxide 2 through 9 parts;

sodium fluosilicate 1 through 6 parts; and

water, to make a total of water, including any that may be associated with the sodium silicate or the potassium silicate of 21.5 through 67 parts, and

thereafter subjecting the mixture to heat as a result of which there is no longer the original content of water.

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**4,298,555**

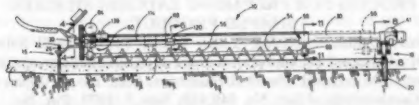
## MECHANIZED TROWEL FOR FINISHING CONCRETE SLABS

**John T. Weltmer, 2623 Villa, Clovis, Calif. 93612**

**Filed Aug. 25, 1980, Ser. No. 181,009**

**Int. Cl.³ E02D *15/02*; E04G *21/10***

**U.S. Cl. 264—31** **9 Claims**



**1**. In a method for mechanically finishing dished-shaped concrete slabs of inverted conical configurations the steps comprising:

positioning an elongated blade of a helical configuration on the upper surface of a body of cement in a plastic state; and simultaneously pushing the cement upwardly, outwardly, and annularly relative to one end of said blade by rotating said blade about its longitudinal axis while simultaneously translating the opposite ends of the blade in a circular path about the one end of the blade.

**4,298,556**

## METHOD FOR MATCHED DIE MOLDING A FIBER REINFORCED POLYURETHANE FOAM MOLDED PRODUCT

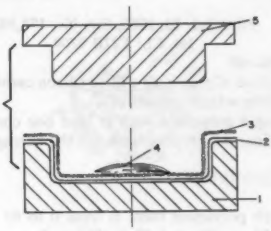
**Peter W. Rutsch, Absteinach, and Michael Brehm, Weinheim an der Bergstrasse, both of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim/an der Bergstrasse, Fed. Rep. of Germany**

**Filed Dec. 13, 1979, Ser. No. 92,187**

**Claims priority, application Fed. Rep. of Germany, Dec. 16, 1978, 2854544**

**Int. Cl.³ B29D *27/04***

**U.S. Cl. 264—46.6** **4 Claims**



**1**. Method for matched die molding a fiber reinforced polyurethane foam molded product, comprising positioning a fiber reinforcement in the female part of an open matched die, placing a foaming reaction mixture of polyol and isocyanate on the reinforcement, closing the male part on the reinforcement so as to compact the reinforcement while the mixture continues foaming, and allowing the foaming reaction to complete so as to produce said product, said fiber reinforcement having a thinness and degree of compaction when said male part is closed normally preventing flow completely throughout the reinforcement prior to completion of the foaming reaction; wherein the improvement comprises initially adding to said mixture from 5% to 30% by weight of a neutral ester having a boiling temperature above the reaction temperature of the mixture, and causing the mixture to flow completely throughout said reinforcement prior to completion of the foaming reaction and while said die's male part is closed so as to produce said molded product with a high density and strength throughout.

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**4,298,557**

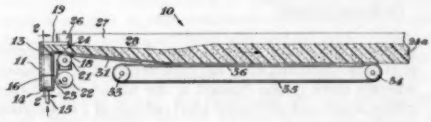
## METHOD AND APPARATUS FOR THE PREPARATION OF FOAMED STRUCTURES

**Larry L. Bradford; David R. Jordan, and Kenneth W. Williams, all of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.**

**Continuation-in-part of Ser. No. 102,681, Dec. 12, 1979, abandoned. This application Apr. 14, 1980, Ser. No. 140,324**

**Int. Cl.³ B29D *27/04***

**U.S. Cl. 264—51** **8 Claims**



**1**. A method for the preparation of flexible polyurethane foam wherein a urethane foam forming mixture is provided, passing said mixture to a dispensing trough wherein partial foaming takes place, the dispensing trough discharging to a moving trough wherein the foam forming mixture expands and

cures to form a flexible polyurethane foam, the improvement which comprises providing means for maintaining a generally uniform temperature across the mixture as the mixture passes from the dispensing trough to the moving trough wherein the generally uniform temperature is obtained by altering the internal configuration of the dispensing trough.

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**4,298,558**

## HIGH YIELD SILICON CARBIDE PRE-CERAMIC POLYMERS

**Ronald H. Baney, and John H. Gaul, Jr., both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.**

**Filed Jul. 23, 1980, Ser. No. 171,553**
**Int. Cl.³ F27B 9/04**
**U.S. Cl. 264—65** **13 Claims**

10. A method of preparing a filled silicon carbide-containing ceramic article which consists of

(A) mixing a polysilane with at least one conventional ceramic filler which polysilane has the average formula

$$\{(CH_3)_2Si\}\{CH_3Si\}$$

in which polysilane there is from 0 to 60 mole percent $(CH_3)_2Si=$ units and 40 to 100 mole percent $CH_3Si=$ units, wherein there is also bonded to the silicon atoms other silicon atoms and radicals having the formula

RO—

wherein R is an alkyl radical of 1 to 4 carbon atoms or phenyl wherein essentially all the remaining bonds on silicon are attached to chlorine or bromine atoms such that the polysilane contains from 24 to 61 weight percent of RO— when R is an alkyl radical, 26 to 66 weight percent of RO— when R is a phenyl radical, and either 0 to 25 weight percent chlorine or 0–35 weight percent bromine, all based on the weight of the polysilane,

(B) forming an article of the desired shape from the mixture of polysilane and fillers and,

(C) heating the article formed in (B) in an inert atmosphere or in a vacuum to an elevated temperature in the range of 1200° C. to 1600° C. until the polysilane is converted to a silicon carbide-containing ceramic.

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**4,298,559**

## HIGH YIELD SILICON CARBIDE FROM ALKYLATED OR ARYLATED PRE-CERAMIC POLYMERS

**Ronald H. Baney, and John H. Gaul, Jr., both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.**

**Filed Jul. 23, 1980, Ser. No. 171,557**
**Int. Cl.³ F27B 9/04**
**U.S. Cl. 264—65** **11 Claims**

8. A method of preparing a filled ceramic article which consists of

(A) mixing a polysilane with at least one conventional ceramic filler which polysilane has the average formula

$$\{(CH_3)_2Si\}\{CH_3Si\}$$

in which polysilane there is from 0 to 60 mole percent $(CH_3)_2Si=$units and 40 to 100 mole percent $CH_3Si=$units, wherein there is also bonded to the silicon atoms other silicon atoms and additional alkyl radicals of 1 to 4 carbon atoms or phenyl;

(B) forming an article of the desired shape from the mixture of polysilane and fillers and,

(C) heating the article formed in (B) in an inert atmosphere or in a vacuum to an elevated temperature in the range of 1200° C. to 1600° C. until the polysilane is converted to a silicon carbide-containing ceramic.

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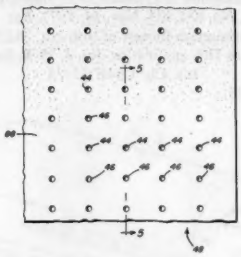
**4,298,560**

## METHOD OF MANUFACTURING A GRATE

**Vernon F. Plass, 6320 Coteswood, Memphis, Tenn. 38134**

**Division of Ser. No. 961,925, Nov. 20, 1978, Pat. No. 4,233,024.**
**This application Jun. 27, 1980, Ser. No. 163,644**
**Int. Cl.³ F27B 9/10**
**U.S. Cl. 264—66** **7 Claims**



1. A method of manufacturing a grate for support of a combustible solid comprising the following steps:

(a) mixing a kaolin-type clay with about 10.4 percent of its weight of water;

(b) adding gradually stainless steel needles having the dimension of about 0.010 inches by 0.022 inches by 1 inch in the amount of 1½ percent of the weight of kaolin-type clay;

(c) mixing the resulting material thoroughly for about 5 minutes;

(d) pouring the mixture into prepared molds while vibrating for proper consistency;

(e) allowing the molds to stand at ambient temperature for about 15 hours to harden;

(f) drilling alternate rows of perpendicular and non-perpendicular through holes having a diameter of ¼ inch on 2 inch centers, the non-perpendicular through holes forming an angle of 15 degrees in the longitudinal direction with respect to a perpendicular;

(g) placing the drilled product in a curing oven at 100 degrees F.;

(h) increasing the oven temperature at a rate of 50 degrees per hour until the oven temperature reaches 1000 degrees F.;

(i) maintaining the oven temperature at 1000 degrees F. for about 8 hours;

(j) increasing the oven temperature 100 degrees per hour until the oven temperature reaches 2000 degrees F.; and

(k) decreasing the oven temperature gradually to an ambient temperature.

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**4,298,561**

## PROCESS FOR PREPARING CALCIUM SILICATE SHAPED PRODUCT

**Mitsuo Uchida, Machida; Yasuo Oguri, Tokyo; Junji Saito, Machida, and Tsukasa Kawahara, Tokyo, all of Japan, assignors to Mitsubishi Chemical Industries, Ltd., Tokyo, Japan**

**Continuation of Ser. No. 849,468, Nov. 7, 1977, Pat. No. 4,193,958. This application Nov. 21, 1979, Ser. No. 96,292**
**Claims priority, application Japan, Nov. 18, 1976, 51/138721; Nov. 22, 1976, 51/140439; Dec. 14, 1976, 51/150066; May 31, 1977, 52/62621**
**The portion of the term of this patent subsequent to Mar. 18, 1997, has been disclaimed.**
**Int. Cl.³ C04B 7/34**
**U.S. Cl. 264—86** **13 Claims**

1. A process for preparing a calcium silicate shaped product which comprises:

forming an aqueous slurry of calcium silicate hydrate of tobermorite group compounds having a wet volume of more than 15 $cm^3/g$ by heating at a temperature higher

than 130° C. a siliceous source and a calcareous source dispersed in water to react them;

shaping the aqueous slurry with a press filter molding;

curing said filter slurry by a steam curing under pressure while transforming said calcium silicate hydrate from semi-crystalline or near-amorphous tobermorite to crystalline tobermorite or xonotlite; o. from crystalline tobermorite to xonotlite; wherein said wet volume is given by the equation:

$$\text{wet volume} = (V/W)$$

wherein W represents the total weight of the calcareous source and the siliceous source, and V represents the volume of solid components after a 24 hours sedimentation of said aqueous slurry.

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**4,298,562**

## METHOD FOR MANUFACTURING SEALING RINGS

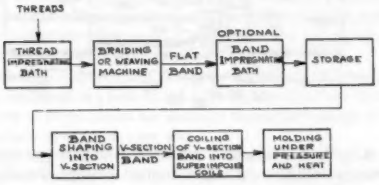
**Cyril X. Latty, 6, Avenue du Maréchal de Lattre de Tassigny, 92210 Saint-Cloud, France**

**Continuation of Ser. No. 860,226, Dec. 13, 1977, abandoned, and a continuation of Ser. No. 654,770, Feb. 3, 1976, abandoned. This application Jun. 15, 1979, Ser. No. 49,032**

**Claims priority, application France, Feb. 4, 1975, 75 03465; Feb. 4, 1975, 75 03468**

**Int. Cl.**[3] **B29G** *5/00;* **D03D** *15/00;* **D03C** *1/02;* **F16J** *9/20*

**U.S. Cl. 264—103** **10 Claims**




1. In a method for manufacturing a substantially wholly flexible substantially V-sectioned sealing ring of a reinforcing first material coated and impregnated with a vulcanized flexible elastomeric second material and defining circumferentially extending flexible lip portions of said two materials, the sealing ring having a uniform homogeneous structure throughout its cross section, said method comprising weaving or braiding a plurality of threads into a band, coiling the band about an axis to form a blank comprising a plurality of coils of the band which are in superimposed relation to each other axially of the blank, and moulding the blank in a mould under pressure with application of heat to impart said substantially V-sectioned shape, said band being put into a substantially V-sectioned shape subsequent to the weaving or braiding thereof but prior to the moulding thereof; the improvement comprising, prior to said weaving or braiding, individually passing said threads through a bath of said elastomeric material so as to individually coat and impregnate said threads whereby said woven or braided band is automatically uniformly and homogeneously impregnated and wholly coated, including on lateral edges thereof, with said elastomeric second material, and weaving or braiding the band to such width that said coated lateral edges of the band define said lip portions of said sealing ring and said sealing ring is wholly constituted by the coils of the coated and impregnated band and has a uniform homogeneous structure throughout its section.

**4,298,563**

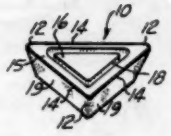
## APPARATUS AND METHOD FOR COMPACTING PRISMATIC OR PYRAMIDAL ARTICLES FROM POWDER MATERIAL

**Raymond P. DeSantis, Royal Oak, and Herbert J. Puffer, Jr., Garden City, both of Mich., assignors to PTX-Pentronix, Inc., Lincoln Park, Mich.**

**Continuation of Ser. No. 952,708, Oct. 19, 1978, abandoned. This application Jun. 27, 1980, Ser. No. 163,932**

**Int. Cl.**[3] **B30B** *11/02;* **B22F** *3/02*

**U.S. Cl. 264—111** **13 Claims**



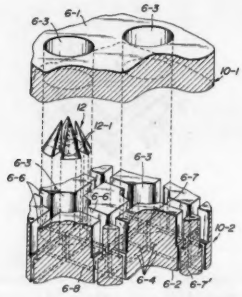

1. An apparatus for compacting powder material to a compacted article provided with a sharp edge at the junction of two surfaces of said article, said apparatus comprising a die having an upper surface and a bore vertically disposed in said die, said bore having peripheral walls forming a die cavity disposed at the top of said bore, said die cavity forming an opening in said upper surface of said die, a punch reciprocably movable in said bore and having an upper end face, a housing displaceable from a position away from said die cavity opening to a position over said die cavity opening, said housing having an end face engageable with said die upper surface, a longitudinal bore in said housing having an opening in said end face, a pair of concentric telescopic counterpunches permanently disposed in said bore in said housing, the innermost of said counterpunches being rigidly interconnected with said housing and having an end face of a peripheral perimeter smaller than the peripheral perimeter of said die cavity opening and the outermost of said counterpunches having an end face of a peripheral perimeter larger than the peripheral perimeter of said die cavity opening and smaller than said housing end face opening, the end face of said outermost counterpunch having a surface portion proximate the peripheral perimeter thereof engageable with said die upper surface and the end face of said outermost counterpunch having an aperture slidably accepting the end of said innermost counterpunch and a surface portion from the edge of said aperture to the surface portion engageable with said die upper surface overlapping said die cavity opening, means simultaneously advancing said housing end face toward said die upper surface for engagement therewith and said innermost counterpunch end face toward said die cavity opening whereby the advance of said housing and of said innermost counterpunch is limited to a predetermined position relative to said outermost counterpunch by engagement of said housing and bore with said die upper surface, and means advancing said punch toward said counterpunches for compacting powder material disposed in said die cavity between the end face of said punch, the end face of said innermost counterpunch and the portion of the end face of said outermost counterpunch overlapping said die cavity opening, whereby an article molded in said die cavity is provided with a lower face formed by said punch end face, sidewalls formed by the walls of said die cavity and an upper face formed by the surface of the end faces of both said counterpunches disposed over said die cavity opening, said sharp edges being at the junction between said sidewalls and said upper face.

**4,298,564**

## DIE FOR EXTRUDING A HONEYCOMB STRUCTURAL BODY AND A METHOD OF EXTRUDING THE SAME

**Noboru Higuchi, Nagoya, and Shoji Futamura, Kawasaki, both of Japan, assignors to NGK Insulators, Ltd., Nagoya and Institute of Technology Precision Electrical Discharge Works, Kawasaki, both of, Japan**

**Filed Apr. 28, 1978, Ser. No. 901,227**
**Claims priority, application Japan, May 4, 1977, 52-51790**
**Int. Cl.³ B29F *3/00***
**U.S. Cl. 264—177 R** **4 Claims**




**1**. In a method of extruding a honeycomb structural body, wherein a raw stock is forcedly supplied into a plurality of feed inlets, which are formed independently from each other in a die, and then extruded from discharge slits, said slits intersecting one another, formed in the die, and wherein each of said feed inlets is opposed to one of said intersections, the improvement comprising storing the raw stock in guide channels formed between the feed inlets and discharge slits and having a width larger than the width of the discharge slits, said guide channels having a cross-sectional area larger than the cross-section area of the discharge slits, and then flowing forcedly the raw stock into the discharge slits.

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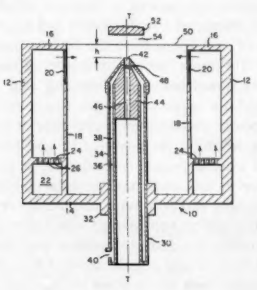
**4,298,565**

## SPINNING PROCESS

**Hung H. Yang, Richmond, Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed Feb. 12, 1980, Ser. No. 120,888**
**Int. Cl.³ D01D *5/14***
**U.S. Cl. 264—181** **8 Claims**




**1**. In a process for preparing high strength, high modulus aromatic polyamide filaments by extruding an acid solution containing at least 30 g. per 100 ml. acid of an aromatic polyamide having an inherent viscosity of at least 4 and chain extending bonds which are either coaxial or parallel and oppositely directed through a layer of inert noncoagulating fluid into a coagulating bath and then through a spin tube along with overflowing coagulating liquid, the improvement comprising jetting additional coagulating liquid symmetrically about the filaments in a downward direction forming an angle $\theta$ of 0° to 85° with respect to the filaments within 2.0 milliseconds from the time the filaments enter the spin tube, the flow rates of both the jetted and overflowing coagulating liquid being maintained at a constant rate such that their momentum ratio $\phi$ is from 0.5 to 6.0 and the mass flow rate of total coagulating liquid is from 70 to 200 times the mass flow rate of the filaments.

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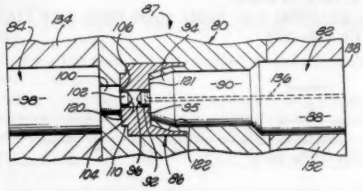
**4,298,566**

## METHOD OF MOLDING ELECTRICAL CONNECTOR INSULATOR

**Hubert W. Naus, Monrovia, and Alfred J. Bouvier, San Juan Capistrano, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.**

**Filed Jan. 7, 1980, Ser. No. 109,982**
**Int. Cl.³ B29C *1/14***
**U.S. Cl. 264—317** **4 Claims**




**3**. A method of making a one-piece, homogeneous electrical connector insulator having a contact passage therethrough with a closed entry defined by a circumferentially continuous inwardly extending annular flange adjacent to one end of said passage and resilient, radially expandable integral contact retention means adjacent to the other end of said passage extending forwardly and inwardly into said passage, comprising the steps of:

providing first and second core pins and a separable bushing, said bushing having a tapered recess in one end thereof for defining the outer surface of said contact retention means, said first core pin having a tapered end portion for defining the inner surface of said contact retention means, and said second core pin having a cylindrical portion of a diameter less than the outer diameter of said bushing for defining the bore in said closed entry;

inserting said first core pin coaxially into the recess in said bushing to a position wherein said tapered end portion thereof is close to but spaced from the tapered wall of said recess;

positioning said second core pin coaxially relative to said bushing with said cylindrical portion thereof adjacent to the other end of said bushing;

providing a continuous annular space immediately surrounding said cylindrical portion of said second core pin for forming said annular flange;

molding an insulator around said bushing and core pins;

removing said core pins from said insulator leaving said bushing therein; and

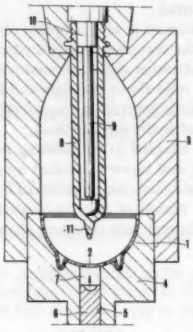
eliminating said bushing from the interior of said insulator.

4,298,567

## STRETCHING AND BLOW MOLDING OF SYNTHETIC RESIN BOTTLES WITH BASE CUPS

Katashi Aoki, 6037, Ohaza Minamijo, Sakakimachi, Hanishina-gun, Nagano-ken, Japan

Filed Aug. 20, 1980, Ser. No. 179,779
Claims priority, application Japan, Aug. 22, 1979, 54-106913
Int. Cl.[3] B29C *17/07*; B29D *3/00*
U.S. Cl. 264—516 2 Claims



1. A method of manufacturing a synthetic resin bottle with a base cup by stretching and blow molding comprising:

(1) inserting and mounting the base cup in a bottom mold of a blow mold, said base cup having a hole of predetermined size at the central portion of the bottom thereof;

(2) stretching a parison with a bottom having a sprue at the bottom surface thereof to the bottom surface of the base cup by means of a stretching rod after closure of the mold, said sprue being so positioned to correspond to the central portion of the blow mold, thereby inserting the sprue into the hole in the bottom of the base cup;

(3) pressing and crushing said sprue by means of a pressing jig mounted in a hole in the central portion of the bottom mold to form a rivet for securely fixing the bottom of the parison to the base cup; and

(4) blowing air into the parison with a bottom to press the bottom surface of the parison with a bottom against the inner surface of the base cup and to allow the bottom surface of the parison with a bottom to adhere securely to the inner surface of the base cup.

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4,298,568

## METHOD AND COMPOSITION FOR INHIBITING CORROSION OF NONFERROUS METALS IN CONTACT WITH WATER

Werner Gerhardt; Volker Wehle, both of Hilden; Andreas Syldatk, Dusseldorf; Gabriele Rogall, Neukirchen-Vluyn; Jürgen Reiffert, Oberhausen, and Jens Conrad, Hilden, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany

Filed Aug. 14, 1980, Ser. No. 177,898
Claims priority, application Fed. Rep. of Germany, Aug. 25, 1979, 2934461
Int. Cl.[3] C23F *11/06, 11/16, 11/12, 11/14*
U.S. Cl. 422—16 10 Claims

1. A method for inhibiting corrosion of non-ferrous metals in contact with circulating water comprising the steps of adding to circulating water in contact with nonferrous metals from 0.05 to 10 $gm/m^3$ of at least one 3-amino-5-alkyl-1,2,4-triazole wherein said alkyl has from 2 to 8 carbon atoms and adjusting said water to a pH of from 6 to 10.

4,298,569

## STEAM-FORMALDEHYDE STERILIZATION INDICATOR

David M. Read, Harlow, England, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 881,471, Feb. 27, 1978, abandoned.
This application Jan. 28, 1980, Ser. No. 115,785
Claims priority, application United Kingdom, Mar. 11, 1977, 10484/77
Int. Cl.[3] A61L *2/18*
U.S. Cl. 422—27 5 Claims

1. A method for indicating that an article has undergone steam-formaldehyde sterilization which comprises attaching an indicator to an article, said indicator comprising a substrate carrying a dye which will undergo an irreversible color change when exposed to formaldehyde vapor in the presence of low temperature steam and wherein a buffering agent is mixed with said dye and said buffer has a pH of from 4 to 6, and then inserting said article with indicator into an environment wherein the article and indicator are exposed to steam and formaldehyde so that the article is sterilized wherein said steam is between 60° and 80° C. and where said indicator will not change color when exposed to 134° C. steam in the absence of formaldehyde for 3½ minutes.

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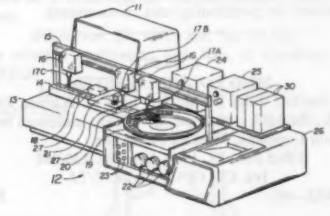
4,298,570

## TRAY SECTION FOR AUTOMATED SAMPLE HANDLING APPARATUS

John E. Lillig, Diamond Bar, and Richard C. Meyer, La Habra, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Apr. 18, 1980, Ser. No. 141,455
Int. Cl.[3] G01N *1/14, 1/18*
U.S. Cl. 422—64 1 Claim



1. A tray for use with an automated sample handling apparatus turntable, said turntable including a circular retaining rim, said circular retaining rim including at least one row of holes arranged in a circular configuration on said rim, said tray comprising a tray section configured as a segment of a circle, said tray section having a relatively narrow innermost width area and a relatively wide outermost width area, said tray section including a first row of wells configured in a relatively narrow arc in said narrow innermost width area and a last row of wells configured in a relatively wide arc in said wide outermost area, said wells formed as an integral part of said tray section and including well portions extending downwardly from said tray section, said last row of wells including a plurality of well portions spaced from each other and from an adjacent row of wells such that each said well portion in said last row is insertible into an adjacent hole in said row of holes in said rim, said tray section thereby retained by said rim.

**4,298,571**

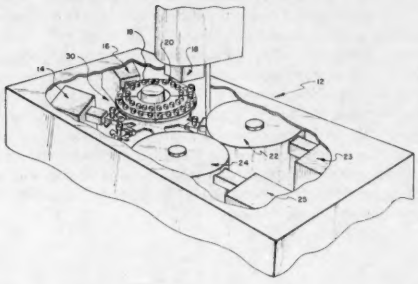
## INCUBATOR INCLUDING COVER MEANS FOR AN ANALYSIS SLIDE

**Anthony P. DiFulvio, and Michael R. Smith, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.**

**Continuation of Ser. No. 751,872, Dec. 17, 1976, Pat. No. 4,224,032, and a continuation of Ser. No. 751,911, Dec. 17, 1976, Pat. No. 4,219,529. This application Jun. 16, 1980, Ser. No. 159,550**

**Int. Cl.³ G01N *35/04***

**U.S. Cl. 422—65** **5 Claims**



1. Apparatus for use in the analysis of fluids deposited on analysis slides, said apparatus comprising:

means defining a temperature-controlled chamber for receiving and conditioning the analysis slides, said chamber having a transfer location at which slides can be transferred from said chamber;

conveyor means in said chamber for supporting the slides during the conditioning thereof and for transporting a selected slide to said transfer location;

cover means in said chamber for controlling evaporation of fluid on the slides, said cover means being positionable into an operative position to at least partially enclose slides on said conveyor and said cover means being positionable to a second position spaced from said operative position to permit said selected slide to be transferred at said location; and

control means for positioning said cover means.

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**4,298,572**

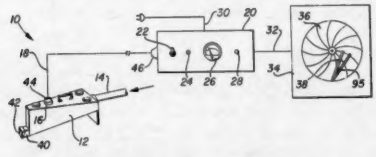
## MUD LOGGING SYSTEM

**John N. Moffet; John D. Moffet, both of Wichita Falls, and David L. Ragsdill, Arlington, all of Tex., assignors to Energy Detection Company, Wichita Falls, Tex.**

**Filed Feb. 27, 1980, Ser. No. 125,241**

**Int. Cl.³ G01N *33/24, 7/14***

**U.S. Cl. 422—68** **5 Claims**



1. Apparatus for automatically and continuously analyzing hydrogen gas associated with drilling mud circulated through a borehole, which comprises:

a sampling chamber having front and back ends, and top and bottom sides;

an inlet in said front end of said sampling chamber for receiving drilling mud from the borehole;

an outlet in said back end of said sampling chamber for returning drilling mud to the borehole;

said sampling chamber having a rectangular cross-sectional shape, increasing in width and decreasing in height from said back end of said sampling chamber to said front end thereof, such that said bottom wall is inclined relative to said top wall of said sampling chamber to thereby facilitate the unobstructed flow of drilling mud from said inlet to said outlet of said sampling chamber and percolate the hydrogen gas out of the drilling mud;

sensing means mounted in said sampling chamber for continuously sensing the concentration of hydrogen gas present in said sampling chamber and associated with the drilling mud as the drilling mud flows through said sampling chamber, said sensing means generating a signal representative of said concentration of hydrogen gas; and

recording means coupled to said sensing means for automatically receiving said signal generated by said sensing means to thereby record said concentration of hydrogen gas over a predetermined period of time associated with the drilling mud flowing through said sampling chamber.

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**4,298,573**

## DEVICE FOR DETECTION OF OXYGEN CONCENTRATION IN COMBUSTION GAS

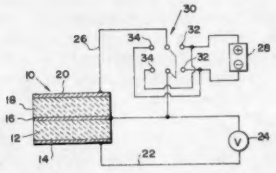
**Takeshi Fujishiro, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan**

**Filed May 15, 1980, Ser. No. 150,059**

**Claims priority, application Japan, May 19, 1979, 54-61023**

**Int. Cl.³ G01N *27/46, 33/22***

**U.S. Cl. 422—94** **11 Claims**



1. A device for detecting the concentration of oxygen in a combustion gas thereby detecting an actual air/fuel ratio of an air-fuel mixture from which the combustion gas was produced, the device comprising a probe to be disposed in the combustion gas, said probe comprising:

a first electrode which is gas permeable;

a second electrode spaced from said first electrode;

an oxygen ion conductive solid electrolyte layer arranged to occupy the space between said first and second electrodes;

a third electrode which is gas permeably porous and spaced from said second electrode; and

a gas permeably porous layer of an oxygen ion conductive solid electrolyte arranged to occupy the space between said second and third electrodes;

at least one of said first and second electrodes being made of a catalytic material which exhibits a catalytic action on oxidation reactions, said first, second and third electrodes being arranged such that the combustion gas directly contacts said first and third electrodes and comes into contact with said second electrode through said gas permeably porous layer occupying the space between said second and third electrodes, so that said probe can generate an electromotive force across said first and second electrodes as an indication of the concentration of oxygen in the combustion gas.

4,298,574

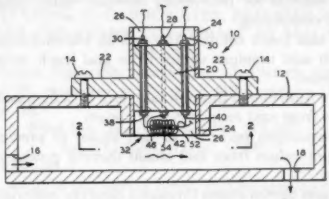
## HYDROGEN GAS DETECTOR

Thomas L. Bohl, Madison, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Continuation of Ser. No. 940,049, Sep. 6, 1978, abandoned, which is a division of Ser. No. 51,664, Jun. 25, 1979, Pat. No. 4,222,900. This application Jan. 10, 1980, Ser. No. 111,046

Int. Cl.³ G01N *27/16*

U.S. Cl. 422—97 6 Claims



1. A detector for monitoring hydrogen gas in a stream comprising:

a first thermocouple junction located in the gas stream;

a second thermocouple junction located in the gas stream and connected to said first thermocouple to form a differential thermocouple;

catalytic means having numerous catalytic sites formed around said first thermocouple junction from etching said catalytic means with Potassium-hydroxide allowing hydrogen in the gas stream to selectively react with said catalytic means above a predetermined threshold temperature to liberate heat and increase the temperature of said first thermocouple above ambient temperature;

heater means for maintaining said first thermocouple junction above the predetermined threshold temperature;

insulation means formed around said second thermocouple junction to prevent hydrogen in the gas stream from reacting with said second thermocouple junction to liberate heat thereby making said second thermocouple junction measure only ambient temperature; and

indicating means connected to said first and second thermocouple junctions to measure the temperature difference measured by said first and second thermocouple junctions to provide an indication of hydrogen content in the gas stream.

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4,298,575

## PIPETTING AND DOSING DEVICE

Erling Berglund, Järfälla, Sweden, assignor to LKB Clinicon Aktiebolag, Bromma, Sweden

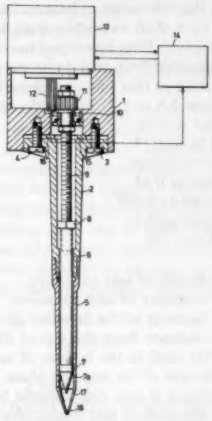
Filed Aug. 27, 1979, Ser. No. 70,268

Claims priority, application Sweden, Sep. 4, 1978, 7809267

Int. Cl.³ B01L *3/02;* G01N *1/14*

U.S. Cl. 73—864.13 9 Claims

1. A pipetting and dosing device comprising an internally cylindrical suction pipe having a conically tapering distal end with a central opening at its apex, a piston axially movable within said suction pipe while sealing against the inner wall of the pipe, the end of said piston facing the distal end of the suction pipe being provided with a conical tip having an apex angle somewhat larger than the apex angle of the conically tapering end of the suction pipe, either of said conical tip of the piston and said conically tapering end of the suction pipe being made of a resiliently deformable material, so that upon movement of the piston into abutment against the conically tapering end of the suction pipe the conical tip of the piston and the conically tapering end of the suction pipe can, by a given elastic deformation of said deformable material, be brought into complete conformity without any residual interspace therebetween, drive means coupled to said piston for moving the piston axially over well-defined distances in said suction pipe for, respectively, sucking up and discharging predeterminable volumes of liquid through said opening, a support housing supporting said piston and said drive means, said suction pipe being attached to said support housing with its opposite end; pressure sensing transducer means disposed between said support housing and said opposite end of the suction pipe for detecting the prevailing axial force between the conical piston tip and the conically tapering end of the suction pipe and for generating a corresponding signal, and control means for said



drive means, said control means being responsive to said transducer signal to interrupt the discharge movement of the piston when said force reaches a predetermined upper limit value sufficient for said given elastic deformation upon abutment of the conical piston tip against the conically tapering end of the suction pipe.

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4,298,576

## POLYMERIZATION AUTOCLAVE

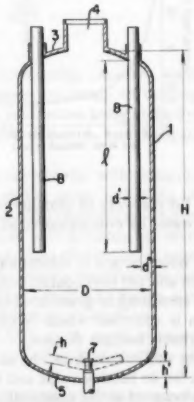
Helmut Thyret; Thomas Balwe; Josef Hanzalik; Herbert Fürst, and Johann Bauer, all of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Nov. 27, 1979, Ser. No. 97,708

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1978, 2852622

Int. Cl.³ C08F *114/08;* B01J *19/18*

U.S. Cl. 422—135 2 Claims



1. A polymerization autoclave for the suspension polymeri-

zation of vinyl compounds in the aqueous phase to form vinyl chloride homopolymers and copolymers of over 60% by weight of vinyl chloride and the remainder ethylenically unsaturated monomers copolymerizable with vinyl chloride, said autoclave having a substantially cylindrical wall with a slightly dished dome and bottom and having a volume of from 70 to 125 $m^3$, heat exchange jacket means attached to the autoclave and being the sole means of heat exchange, an impeller agitator mounted on a shaft extending from the bottom of said autoclave and driven from below and two cylindrical displacement bodies suspended from said dome and acting as flow interrupters, consisting in that said autoclave has a height-to-diameter ratio of from 2.5 to 2.7 and satisfies the following ratios:

$d/D = 0.5$ to 0.53
$h/d = 0.16$ to 0.17
$h/H = 0.03$ to 0.04
$l/H = 0.35$ to 0.45
$d'/l = 0.085$ to 0.095
$d''/d'' = 0.9$ to 1.1
$h'/h = 1.7$ to 2.0

wherein

H = the height of said autoclave
D = the diameter of said autoclave
d = the diameter of the impeller agitator
h' = the distance from the top of the impeller blade at the impeller shaft to the bottom of said autoclave
h = the height of the impeller blade
l = the length of said displacement body
d' = the diameter of said displacement body
d'' = the distance of said displacement body from the cylindrical wall of said autoclave.

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**4,298,577**

## PROCESS FOR RECOVERY OF URANIUM FROM SEA WATER

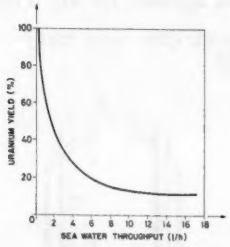
**Ludwig Ashtheimer, Jülich; Hans-Joachim Schenk, Aachen, and Klaus Schwochau, Jülich, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich GmbH, Jülich, Fed. Rep. of Germany**

**Filed May 19, 1978, Ser. No. 907,630**

**Claims priority, application Fed. Rep. of Germany, May 20, 1977, 2722838**

**Int. Cl.³ C01G *43/00***

**U.S. Cl. 423—6** **2 Claims**




1. A process for recovery of uranium naturally occurring in solution in sea water by concentrative adsorption, comprising the steps of:

bringing sea water which is substantially unmodified as to composition and pH into contact with an adsorbent-holding matrix consisting of granulated lignite until a quantity of uranium is adsorbed which is substantially the maximum adsorbable amount thereof;

then removing said matrix from the sea water and burning said matrix for its heating value and thereby also concentrating the uranium in the combustion residue; and

treating said residue to recover the uranium from the residue in the form of its salts.

**4,298,578**

## LEACH METHOD INCLUDING MEANS TO PROTECT ION EXCHANGE RESIN

**Tsoung-yuan Yan, Philadelphia, Pa., and Raymond L. Lozano, Thoreau, N. Mex., assignors to Mobil Oil Corporation, New York, N.Y.**

**Filed Nov. 24, 1978, Ser. No. 963,662**

**Int. Cl.³ C01G *43/00***

**U.S. Cl. 423—7** **8 Claims**

5. A method for recovering uranium values from a leach solution comprising:

passing said leach solution through an ion-exchange resin to adsorb said uranium values from said leach solution onto said resin;

passing a fresh eluant through said resin to desorb said uranium values from said resin into said uluant;

adding hydrogen peroxide to said eluant to precipitate said uranium values from said eluant thereby producing barren eluant;

passing said barren eluant through a catalytic material effective to decompose hydrogen peroxide into water and oxygen; and

adding chemicals to said barren eluant after it passes through said catalytic material to make up fresh eluant for recycle in said method.

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**4,298,579**

## METHOD OF PRODUCING $PuO_2$ BY CALCINATION OF PU OXALATE PRODUCED BY DISCONTINUOUS PRECIPITATION FROM SOLUTIONS CONTAMINATED WITH AMERICIUM

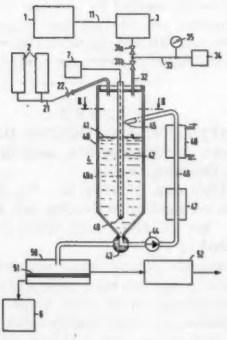
**Karl-Dieter Kuhn, Liedolsheim, and Karl-Heinz Koch, Alzenau-Albstadt, both of Fed. Rep. of Germany, assignors to Alkem GmbH, Hanau, Fed. Rep. of Germany**

**Filed Jun. 1, 1977, Ser. No. 802,553**

**Claims priority, application Fed. Rep. of Germany, Jun. 3, 1976, 2624990**

**Int. Cl.² C01G *56/00***

**U.S. Cl. 423—11** **10 Claims**



1. In a method for the production of $PuO_2$ by discontinuous precipitation of Pu oxalate from a Pu nitrate-nitric acid solution in a reaction vessel with solid oxalic acid or solid ammonium oxalate, subsequent separation of the Pu oxalate precipitate from the residual liquid and calcination of the Pu oxalate precipitate to $PuO_2$, the improvement comprising concurrently preventing americium contained in said Pu nitrate-nitric acid solution as a contaminant from passing into said Pu oxalate precipitate by maintaining the Pu nitrate-nitric acid solution containing americium as a contaminant at a temperature of 60°–95° C., adding to said 60°–95° C. solution an amount of said solid oxalic acid or solid ammonium oxalate in free-flowing granular form substantially free of clusters and lumps, in stoichiometric deficiency of up to 7% of oxalic acid for reaction

with the Pu in said 60°–95° C. solution, separating the resultant Pu oxalate precipitate into which at least a portion of the americium contaminant has been prevented from entering from the residual liquid in which the americium contaminant is retained and calcining the thus purified Pu oxalate precipitate to $PuO_2$.

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**4,298,580**

## SEPARATION OF COBALT AND MANGANESE FROM TRIMELLITIC ACID PROCESS RESIDUE BY PRECIPITATING AS CARBONATES, REDISSOLVING AS HALIDES AND REMOVING COBALT BY MAGNETIC MEANS

**Jon J. Harper, Naperville, and Stephen J. Pietsch, Oak Park, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.**

**Filed Dec. 19, 1980, Ser. No. 218,061**
**Int. Cl.³ C01G** *45/06, 51/08*
**U.S. Cl. 423—40** **11 Claims**

1. A method of recovering cobalt and manganese and separating recovered cobalt from recovered manganese from residue obtained from the manufacture of trimellitic acid produced by the oxidation of liquid pseudocumene with molecular oxygen in the presence of cobalt and manganese as the metal oxidation catalyst; which method of recovery and separation comprises dissolving the acidic organic components of said residue in water containing carbonate ion together with sodium, or potassium, or ammonium ions and precipitating catalyst metals as carbonates; separating the aqueous solution from the metal carbonate precipitate; redissolving the catalyst metals as their halides by mixing the carbonate precipitate with an aqueous solution containing hydrochloric or hydrobromic acid in an amount to provide a solution pH of 3 to 4 thereby precipitating iron, if present,; thereafter adjusting the precipitate-free solution's pH to 5 to 6 and adding powdered manganese thereto in an amount of from 1 to 2 chemical equivalents for each 1.0 chemical equivalent of cobalt in solution thereby precipitating metallic cobalt; and magnetically separating the pH-adjusted solution from the metallic cobalt precipitate.

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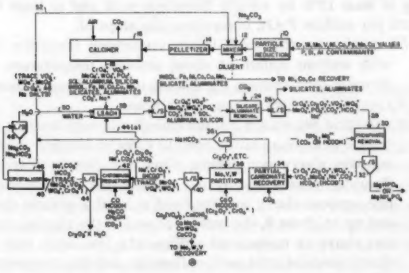
**4,298,581**

## PROCESS FOR RECOVERING CHROMIUM, VANADIUM, MOLYBDENUM AND TUNGSTEN VALUES FROM A FEED MATERIAL

**Donald A. Douglas, Amherst, N.H.; Jameel Menashi, Lexington, and Alkis S. Rappas, Bedford, both of Mass., assignors to Cabot Corporation, Kokomo, Ind.**

**Filed Apr. 15, 1980, Ser. No. 140,437**
**Int. Cl.³ C01G** *31/00, 37/00, 39/00, 41/00*
**U.S. Cl. 423—58** **20 Claims**



1. A process for recovering chromium, vanadium, molybdenum, and tungsten values from a feed material containing said values and one or more values selected from the group consisting of cobalt, nickel, iron and copper, said process comprising the steps of:

A. calcining said feed material in an oxygen containing atmosphere and in the presence of sodium carbonate;

B. water leaching the product of the calcination of step A to produce an aqueous alkaline leach liquor containing chromium, tungsten, vanadium, and molybdenum values;

C. selectively removing molybdenum, tungsten, and vanadium from the leach liquor produced in step B by treatment with calcium ions to produce a mixed calcium cake containing tungstate, vanadate, and molybdate ions and a chromium containing leach liquor;

D. reducing and recovering chromium values in the leach liquor of step C, a carbon containing reducing agent being used to reduce the leach liquor;

E. treating the calcium cake containing tungstate, vanadate, and molybdate ions produced in step C with an aqueous acidic solution to selectively remove calcium and vanadium values as a vanadium containing liquor;

F. recovering vanadium from the liquor of step E;

G. selectively dissolving molybdenum and tungsten from the calcium cake remaining after step E while precipitating calcium as a substantially tungsten and molybdenum-free solid, $H_2O_2$ being used to partition calcium; and

H. recovering molybdenum and tungsten from the solution resulting from step G.

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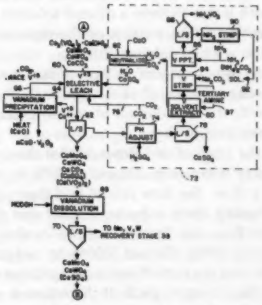
**4,298,582**

## VANADIUM RECOVERY FROM SCRAP ALLOYS

**Jameel Menashi, Lexington; Alkis S. Rappas, Bedford, both of Mass., and Donald A. Douglas, Amherst, N.H., assignors to Cabot Corporation, Kokomo, Ind.**

**Filed Apr. 15, 1980, Ser. No. 140,569**
**Int. Cl.³ C01G** *31/00*
**U.S. Cl. 423—58** **17 Claims**



1. A process for partitioning vanadate anions from anions selected from the group consisting of tungstate, molybdate, and mixtures thereof, said anions being in the form of a mixture of alkaline earth metal precipitates, said process comprising the steps of

A. contacting said precipitates with an aqueous acidic solution selected from the group consisting of carbonic acid solution having a superatmospheric $CO_2$ pressure, formic acid solution, acetic acid solution, and mixtures thereof to selectively dissolve the alkaline earth metal vanadate;

B. separating a substantially tungsten and molybdenum-free solution containing dissolved alkaline earth metal vanadate from the remaining precipitate;

C. treating the alkaline earth metal vanadate solution produced in step B to induce precipitation of vanadium values; and

D. separating the precipitated vanadium values produced in step C from the remaining solution;

4,298,583

## PROCESS FOR MANUFACTURING PHOSPHORIC ACID

Armand L. Davister, Liege, Belgium, and Samuel V. Houghtaling, Lakeland, Fla., assignors to Davy Powergas, Inc., Lakeland, Fla.

Filed Nov. 18, 1977, Ser. No. 852,614
Claims priority, application Luxembourg, Nov. 4, 1977, 78457
Int. Cl.[3] C01F *11/46;* C01B *25/22*
U.S. Cl. 423—167 22 Claims

1. In the process for the manufacturer of phosphoric acid by the wet process which comprises

introducing phosphate rock, sulfuric acid and phosphoric acid as feed components into one or more reaction zones of an attack system,

reacting said rock, sulfuric acid and phosphoric acid in said attack system to produce a reaction slurry of an aqueous solution of phosphoric acid and crystallized calcium sulfate as end-products of the process, said attack system having a plurality of reaction zones and comprising a serial and cyclic flow of said slurry through at least some of said reaction zones,

agitating said slurry in each of said plurality of reaction zones, at least one of said plurality of reaction zones being in slurry flow communication with at least one vacuum cooling zone having a pressure lower than the pressure in said at least one reaction zone,

passing a flow of reaction slurry from said at least one reaction zone communicating with said vacuum cooling zone, evaporating water from said slurry in said cooling zone to cool the slurry therein,

returning the resulting cooled flow of slurry from said vacuum cooling zone to said at least one reaction zone,

withdrawing a portion of said reaction slurry from said attack system at a basic slurry flow corresponding to the total feed rate of said feed components to said attack system, separating phosphoric acid and calcium sulfate crystals from said withdrawn portion of slurry, washing said calcium sulfate crystals with water to form a diluted solution of phosphoric acid, collecting a first portion of the separated phosphoric acid and the washed calcium sulfate,

passing to said attack system, as part of said feed components, the remaining portion of said separated phosphoric acid, together with the said diluted phosphoric acid solution, the improvement comprising

maintaining the rates of said flows so that the cyclic flow rate of said slurry is between 300 and 4000% by weight of said basic slurry flow, the flow rate of said slurry passing to said vacuum cooling zone is between 2000 and 4000% of said basic slurry flow, the flow rate of the local agitation in said reaction zones being 500 and 2200% by weight of said basic slurry flow, and the sum of said local agitation flow rates and the cyclic flow rates in each of the reaction zones wherein feed components are introduced which immediately follow them in the direction of the slurry flow through the reactors being not less than 2500% of said basic slurry flow.

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4,298,584

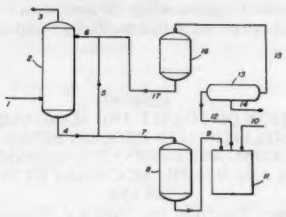
## REMOVING CARBON OXYSULFIDE FROM GAS STREAMS

Alkis C. Makrides, Newton Center, Mass., assignor to EIC Corporation, Newton, Mass.

Filed Jun. 5, 1980, Ser. No. 156,682
Int. Cl.[3] B01D *53/34*
U.S. Cl. 423—242 7 Claims

1. A process for removing carbon oxysulfide from a gas stream, comprising

contacting said gas stream with a liquid stream comprising a liquid solution of a scrubbing agent comprising copper sulfate buffered to a pH sufficiently acidic to prevent the precipitation of basic copper salts at operating conditions, thereby to react said copper sulfate with said carbon oxysulfide to precipitate copper sulfides, and



removing at least some of said copper sulfides from said liquid solution.

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4,298,585

## PROCESS OF MAKING SODIUM PERBORATE

Jean Malafosse, Sassenage; Andre Girou, Toulouse; Herve Olivier, Santenay-les-Bains, and Michel Dupont, Chagny, all of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Apr. 16, 1980, Ser. No. 140,703
Claims priority, application France, May 3, 1979, 79 11090
Int. Cl.[3] C01B *15/12*
U.S. Cl. 423—279 7 Claims

1. In a process of making sodium perborate hexahydrate crystals comprising reacting hydrogen peroxide with a sodium metaborate solution, the improvement wherein the crystallization of the sodium perborate is performed in the presence of a carboxylic polymer having a high potential content of free carboxylic acid groups, said polymer being a maleic anhydride copolymer with an organic compound having an ethylene bond.

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4,298,586

## RECOVERY OF HYDROFLUORIC ACID FROM FLUOSILICIC ACID

Subhas K. Sikdar, San Juan Capistrano, Calif., assignor to Occidental Research Corp., Irvine, Calif.

Continuation of Ser. No. 953,803, Oct. 23, 1978, abandoned.
This application Aug. 23, 1980, Ser. No. 177,558
Int. Cl.[3] C01B *33/12, 7/22;* C01D *3/02*
U.S. Cl. 423—339 28 Claims

16. A method for recovering hydrogen fluoride and solid amorphous silica from phosphate plant scrub liquor comprising at least 15% by weight fluosilicic acid and at least 1000 parts per million $P_2O_5$, comprising the steps of:

(a) combining the scrub liquor containing fluosilicic acid with sodium sulfate at about ambient temperature and forming solid sodium fluosilicate in a purification zone;

(b) recovering such sodium fluosilicate;

(c) reacting recovered sodium fluosilicate with sodium carbonate in a precipitation zone to form an alkaline aqueous aqueous slurry comprising silica and dissolved sodium fluoride; wherein during said reaction the pH of the alkaline aqueous slurry is maintained at a value greater than 7 and up to about 9, the water content of the alkaline aqueous slurry is maintained sufficiently low such that the slurry contains solid sodium fluoride, and the temperature of the alkaline aqueous slurry is maintained substantially equal to its boiling point so that an amorphous silica precipitate is formed;

(d) adding sufficient water to the alkaline aqueous slurry in a dissolving zone to dissolve substantially all of the solid sodium fluoride; and thereafter;

(e) separating at least a part of the precipitated amorphous

silica from the alkaline aqueous slurry leaving an aqueous solution comprising sodium fluoride;

(f) evaporating water from the aqueous solution comprising sodium fluoride in an evaporation zone to form an aqueous slurry comprising solid sodium fluoride and a solution saturated with respect to sodium fluoride;

(g) recycling at least a portion of evaporated water to the dissolving zone;

(h) passing the aqueous slurry from the evaporation zone to a separation zone and separating the solid sodium fluoride from the solution saturated with respect to sodium fluoride;

(i) introducing at least a portion of the solution saturated with respect to sodium fluoride from the separation zone to the precipitation zone;

(j) reacting solid sodium fluoride separated in the separation zone with sulfuric acid in a hydrogen fluoride generation zone maintained at a temperature of at least about 80° C. to form hydrogen fluoride and sodium sulfate;

(k) introducing at least a portion of the sodium sulfate formed in the hydrogen fluoride generation zone to the purification zone; and

(l) recovering hydrogen fluoride formed in the hydrogen fluoride generation zone.

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**4,298,587**

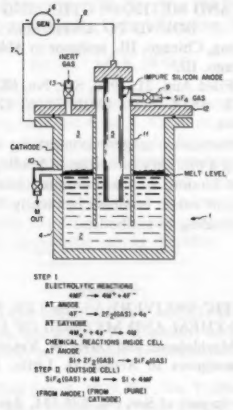
## SILICON PURIFICATION

**Vijay K. Kapur, Northridge, Calif., assignor to Atlantic Richfield Company, Los Angeles, Calif.**

**Filed Oct. 28, 1980, Ser. No. 201,660**

**Int. Cl.³ C01B *33/02*; C25B *1/24***

**U.S. Cl. 423—350** **11 Claims**




1. In a method for purifying silicon which contains impurities, the improvement comprising providing said impure silicon in electrode form, employing said electrode as the anode in a heated electrolytic cell, said elecytrolytic cell also containing a cathode, an inert atmosphere, and an electrolyte, said electrolyte consisting essentially of an alkali metal fluoride, an alkaline earth metal fluoride, or combinations of two or more thereof, said cell being operated at a temperature and an electrical current and voltage such that elemental fluorine is formed from said electrolyte at said anode and silicon is removed from said anode as vaporous $SiF_4$, and elemental metal is formed from said electrolyte at said cathode, collecting said $SiF_4$, separately reacting said collected $SiF_4$ with an alkali metal, alkaline earth metal, or combination of two or more of such metals to form the fluoride of said metal or metals and purified elemental silicon, and separating said purified silicon from said fluoride.



**4,298,588**

## AMMONIA PRODUCTION PROCESS

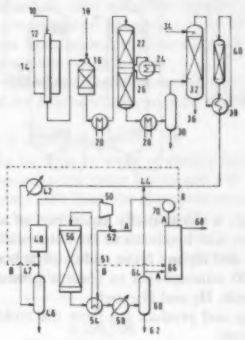
**Alwyn Pinto, Stockton-on-Tees, England, assignor to Imperial Chemical Industries Limited, London, England**

**Continuation of Ser. No. 934,259, Aug. 16, 1978, abandoned. This application Dec. 19, 1979, Ser. No. 105,297**

**Claims priority, application United Kingdom, Aug. 22, 1977, 35096/77; Oct. 27, 1977, 44766/77; Oct. 28, 1977, 44996/77**

**Int. Cl.³ C01C *1/04***

**U.S. Cl. 423—359** **12 Claims**



1. An ammonia production process which comprises

(a) primary catalytically reforming at superatmospheric pressure a hydrocarbon feedstock with steam to give a gas containing carbon oxides, hydrogen and methane;

(b) secondary catalytically reforming the gas from step (a) by introducing air and bringing the mixture towards equilibrium, whereby to produce a gas containing nitrogen, carbon oxides, hydrogen and a decreased quantity of methane;

(c) converting carbon monoxide catalytically with steam to carbon dioxide and hydrogen;

(d) removing carbon oxides to give a nitrogen-hydrogen ammonia synthesis gas and compressing said gas to ammonia synthesis pressure;

(e) reacting the synthesis gas to produce ammonia and recovering ammonia from the reacted gas; and

(f) discarding non-reactive gases present in the synthesis gas; and is characterized by:

(i) operating step (a) at a pressure of 40–80 bar absolute and in conditions of steam-to-carbon ratio and temperature to produce a gas containing at least 10% v/v methane and using in step (b) a quantity of air in excess of what would introduce 1 molecule of nitrogen per 3 molecules of hydrogen;

(ii) in step (d) compressing said ammonia synthesis gas including excess nitrogen resulting from said use of excess air in step (i) by no more than 100 bar; and

(iii) treating a side stream of synthesis gas after reaction to synthesise ammonia to separate a stream enriched in hydrogen and returning the enriched stream to the synthesis.

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**4,298,589**

## SPLIT AXIAL FLOW CONVERTER IN AMMONIA SYNTHESIS

**Joseph R. LeBlanc, and Robert B. Peterson, both of Houston, Tex., assignors to The M. W. Kellogg Company, Houston, Tex.**

**Filed Jun. 17, 1980, Ser. No. 160,358**

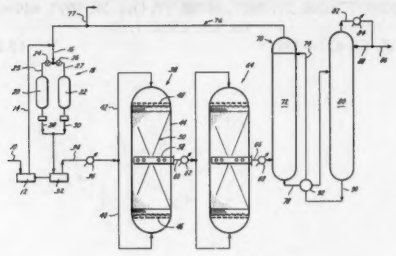
**Int. Cl.³ C01C *1/04***

**U.S. Cl. 423—359** **2 Claims**

1. A process for the production of ammonia which comprises:

compressing an ammonia synthesis gas containing $H_2$ and $N_2$ to a pressure of between 45 and 80 atmospheres;

introducing said ammonia synthesis gas in two equal streams to an ammonia converter, one stream of said ammonia synthesis gas introduced to the bottom of said converter and the other stream of said ammonia synthesis gas introduced to the top of said converter, each stream passing



through a substantially equal bed of ammonia synthesis catalyst which extends to the outer wall of said converter;

reacting said $H_2$ and $N_2$ in said catalyst bed at a pressure less than 80 atmospheres to form a product gas containing ammonia, $H_2$ and $N_2$; and

removing said product gas from the middle portion of said converter.

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**4,298,590**

**DETECTION OF MALIGNANT TUMOR CELLS**

**Samuel Bogoch, 46 E. 91st St., New York, N.Y. 10028**

**Continuation-in-part of Ser. No. 553,075, Feb. 25, 1975, which is a continuation-in-part of Ser. No. 550,432, Feb. 18, 1975, abandoned, and Ser. No. 450,404, Mar. 12, 1974, abandoned, and Ser. No. 385,451, Aug. 3, 1973, abandoned. This application Jul. 7, 1978, Ser. No. 922,799**

**Int. Cl.**[3] **A61K** *49/00, 43/00;* **G01N** *33/48*

**U.S. Cl. 424—1** **17 Claims**

1. A process for detecting the presence of cancerous or malignant tumor cells in a cell collection, comprising applying to said cell collection anti-cancer RECOGNIN or a purified fraction thereof, whereby said anti-cancer RECOGNIN or purified fraction thereof preferentially attaches to cancerous cells and can thereby be detected by attached visible or signal-emitting means, said cancer RECOGNIN comprising a product, derived from cancerous tumor tissue or cells, characterized by forming a single line precipitate with its specific antibody in quantitative precipitin tests and Ouchterlony gel diffusion tests, being soluble in water and aqueous solutions having an acid or neutral pH, and insoluble at alkaline pH, having a spectrophotometric absorption peak wave length of 280 mu and a molecular weight of from about 3,000 to about 25,000, and further characterized by having an amino acid residue composition characterized by high proportions of glutamic and aspartic acids and high ratios of glutamic and aspartic acids to histidine.

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**4,298,591**

**INSTANTANEOUS RADIOIODINATION OF ROSE BENGAL AT ROOM TEMPERATURE AND A COLD KIT THEREFOR**

**Harold A. O'Brien, Jr., Los Alamos, N. Mex.; Homer B. Hupf, Sausolito, Calif., and Philip M. Wanek, Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.**

**Filed Apr. 3, 1979, Ser. No. 26,509**

**Int. Cl.**[3] **A61K** *49/00, 43/00;* **G01T** *1/00;* **B65D** *71/00*

**U.S. Cl. 424—1** **12 Claims**

1. A method for radioiodinating rose bengal comprising the steps of:

placing rose bengal and a suitable oxidizing agent in acidified ethanol;

stirring the solution resulting until it forms a uniform suspension;

adding an iodide in which the iodine moiety is radioactive; and

allowing the resulting mixture to stand for a time sufficient for the exchange label reaction to occur.

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**4,298,592**

**DOUBLE ANTIBODY SEPARATION METHOD**

**Wayne H. T. Lin, Chesterfield; James J. Grib, and Larry D. Mosier, both of St. Louis, all of Mo., assignors to Mallinckrodt, Inc., St. Louis, Mo.**

**Filed Apr. 5, 1979, Ser. No. 27,387**

**Int. Cl.**[3] **G01N** *33/48;* **G01T** *1/00;* **A61K** *43/00;* **B65D** *71/00*

**U.S. Cl. 424—1** **9 Claims**

1. A double antibody radioimmunoassay method for determining antigens in a sample, comprising providing polyethylene glycol having a molecular weight of from about 200 to about 10,000 in a reaction medium containing labeled antigen, said polyethylene glycol being present in said reaction medium in an amount sufficient to accelerate an immunoprecipitation reaction between water-soluble first antibodies in a first antibody reagent bound to antigens and water-soluble antibodies in a second antibody reagent which are not specific to said antigens to be assayed but which are specific to said first antibodies.

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**4,298,593**

**REAGENTS AND METHODS UTILIZING LABELED FAB BOUND TO ANTIGENS**

**Chung-Mei Ling, Chicago, Ill., assignor to Abbott Laboratories, North Chicago, Ill.**

**Filed Aug. 21, 1979, Ser. No. 68,772**

**Int. Cl.**[3] **A61K** *43/00;* **G01N** *33/48;* **G01T** *1/00*

**U.S. Cl. 424—1** **4 Claims**

1. An immunoassay reagent comprising a solution of an antigen having a plurality of antigenic binding sites wherein a portion of the binding sites are immunochemically bound to labeled Fab and other immunochemically binding sites are available for binding to antibodies.

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**4,298,594**

**XENOBIOTIC DELIVERY VEHICLES, METHOD OF FORMING THEM AND METHOD OF USING THEM**

**Barry Sears, Marblehead, and David W. Yesair, Newbury, both of Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.**

**Continuation-in-part of Ser. No. 896,311, Apr. 14, 1978. This application Apr. 4, 1980, Ser. No. 137,312**

**Int. Cl.**[3] **A61K** *9/22, 9/42, 9/52*

**U.S. Cl. 424—19** **128 Claims**

33. A method of forming a delivery vehicle for delivering to and releasing within the aqueous environment of a mammalian host a xenobiotic, the pharmocodynamics of which are predeterminably altered and controlled comprising forming microreservoirs of a composition comprising a phospholipid constituents and a phospholipid-immiscible lipid constituent present in an amount exceeding that which is miscible with said phospholipid constituent to form said microreservoirs having a structure in which contact between said phospholipid-immiscible lipid constituent and said aqueous environment is minimized to impart to said delivery vehicle said microreservoirs being in nonvesicular form having diameters ranging between about 250 A and about 1000 A, vesicular form having diameters ranging between about 190 A and about 300 A, or both nonvesicular and vesicular forms.

4,298,595

## PHARMACEUTICAL PREPARATIONS CONTAINING A POLYMERIC AGENT FOR RELEASING 5-AMINOSALICYLIC ACID OR ITS SALTS INTO THE GASTROINTESTINAL TRACT

Thomas M. Parkinson; Joseph P. Brown, and Robert E. Wingard, Jr., all of Palo Alto, Calif., assignors to Dynapol, Palo Alto, Calif.

Division of Ser. No. 971,609, Dec. 20, 1978, Pat. No. 4,190,716. This application Nov. 29, 1979, Ser. No. 95,411

Int. Cl.[3] A61K *31/74*

U.S. Cl. 424—78 38 Claims

1. A pharmaceutical formulation for the treatment of the mucosa of the mammalian lower intestinal tract comprising an amount therapeutically effective for such treatment of a polymeric compound which itself comprises a pharmacologically acceptable organic polymer backbone comprising a plurality of aromatic rings and having a molecular size which precludes the backbone's absorption from the intestinal lumen and a plurality of salicyclic acid or pharmaceutically acceptable salicylate salt groups covalently bonded to said backbone via azo groups that are intermediate backbone aromatic carbons and said salicyclic acid or pharmaceutically acceptable salicylate salt 5-position carbons in association with a pharmaceutically acceptable carrier therefor.

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4,298,596

## *TRYPANOSOMA CRUZI* GLYCOPROTEIN VACCINE FOR INDUCING IMMUNITY TO CHAGAS' DISEASE

David Snary, Orpington, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Mar. 26, 1980, Ser. No. 134,262

Claims priority, application United Kingdom, Mar. 29, 1979, 11049/79

Int. Cl.[3] A61K *39/005*

U.S. Cl. 424—88 4 Claims

1. A vaccine for inducing immunity to Chagas' disease comprising an antigen obtained from T. Cruzi organisms comprising glycoprotein of molecular weight from about $6\times10^4$ to about $9.5\times10^4$, said glycoprotein being substantially insoluble in water and being capable of interacting with lectins which have an affinity for glucose, mannose or galactose, said antigen being substantially free from non-proteinaceous matter and a pharmaceutically acceptable carrier therefor.

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4,298,597

## VACCINE FOR DIARRHEA CAUSED BY *E. COLI*

Stephen D. Acres, and Robert A. Kapitany, both of Saskatoon, Canada, assignors to University of Saskatchewan, Saskatoon, Canada

Filed Sep. 4, 1979, Ser. No. 71,994

Int. Cl.[3] A61K *39/108, 39/116*

U.S. Cl. 424—92 21 Claims

1. A vaccine for promoting in cattle the formation of antibodies against antigens from enterotoxigenic *E. coli* comprising an aqueous suspension or solution containing an effective amount of K99 antigen, polysaccharide K antigens, lipopolysaccharide O antigens, enterotoxins, or combinations of the foregoing constituents, said vaccine lacking whole intact cells, but containing cell fragments and other cellular and culture broth constituents having a molecular weight greater than 1000; said vaccine being prepared by a method comprising:

(a) growing several selected enterotoxigenic strains of *E. coli* in a broth culture medium under aerobic conditions, with agitation;

(b) pooling the *E. coli* cultures;

(c) disrupting the bacteria by input of energy for removal of cell wall polysaccharide outer layers and pili;

(d) removing intact cells from the disrupted suspension; and

(e) selectively concentrating the subcellular antigens for removal of undesired low molecular weight components and excess water by passing the suspension through an ultrafiltration membrane.

12. A method of preventing neonatal diarrhea in calves comprising the step of administering to the pregnant cow prior to parturition a vaccine containing an effective amount of K99 antigen, polysaccharide K antigens, lipopolysaccharide O antigens, enterotoxins, or combinations of the foregoing constituents, said vaccine lacking whole intact cells, but containing cell fragments and other cellular and broth constituents having a molecular weight greater than 1000, in combination with a suitable adjuvant, said effective amount of vaccine inducing in the cow effective colostral levels of antibodies against said antigens from enterotoxigenic *E. coli;* said vaccine being prepared by a method comprising:

(a) growing several selected enterotoxigenic strains of *E. coli* in a broth culture medium under aerobic conditions, with agitation;

(b) pooling the *E. coli* cultures;

(c) disrupting the bacteria by input of energy for removal of cell wall polysaccharide outer layers and pili;

(d) removing intact cells from the disrupted suspension; and

(e) selectively concentrating the subcellular antigens for removal of undesired low molecular weight components and excess water by passing the suspension through an ultrafiltration membrane.

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4,298,598

## TISSUE ADHESIVE

Otto Schwarz; Yendra Linnau; Franz Löblich, and Thomas Seelich, all of Vienna, Austria, assignors to Immuno Aktiengesellschaft für chemisch-medizinische Produkte, Vienna, Austria

Filed Feb. 4, 1980, Ser. No. 118,656

Claims priority, application Austria, Feb. 15, 1979, 1190/79

Int. Cl.[3] A61K *35/14, 37/00*

U.S. Cl. 424—101 5 Claims

1. A tissue adhesive comprising plasma proteins of human or animal origin, which plasma proteins contain: factor XIII in an amount of at least 7 units/ml, fibrinogen in an amount of at least 70 mg/ml, the ratio of factor XIII to fibrinogen, expressed in units of factor XIII per gram of fibrinogen, amounting to at least 100; cold-insoluble globulin and albumin, the ratio of fibrinogen to cold-insoluble globulin to albumin being 60 to 98: 0.5 to 20: 0 to 15; aprotinin in an amount of 20 to 2,000 KIU per ml, wherein the tissue adhesive as determined according to the SDS-polyacrylamide-gel-electrophoresis method is capable of complete cross-linking of the fibrin-γ-chains after 3 to 5 minutes of incubation and of at least 35% cross-linking of the fibrin-α-chains after two hours of incubation.

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4,298,599

## NOVEL ANTIBIOTIC BN-235 SUBSTANCE, AND PROCESS FOR THE PRODUCTION THEREOF

Shoichi Amano, Kawasaki; Shinji Miyadoh, Yokohama; Saeko Takahashi, Tokyo; Norio Ezaki, Yokohama; Tomizo Niwa, Yokohama, and Yujiro Yamada, Yokohama, all of Japan, assignors to Meiji Seika Kaisha, Ltd., Tokyo, Japan

Filed Sep. 12, 1980, Ser. No. 186,793

Claims priority, application Japan, Sep. 12, 1979, 54-116200

Int. Cl.[3] A61K *35/00*

U.S. Cl. 424—119 2 Claims

1. An antibiotic BN-235 substance, the hydrochloride of which has the following properties:

Elemental analysis values:

Carbon 55.44%

Hydrogen 6.41%

Nitrogen 9.02%

Chlorine 12.01%

Oxygen 17.12% (balance)

Molecular weight: about 520 (by the vapor pressure method)

Melting point: 230° to 232° C. (decomp.)

Ultraviolet absorption spectrum: shown in FIG. 1

Infrared absorption spectrum: Absorption bands at 3420, 2960, 1670, 1520, 1480, 1460, 1430, 1390, 1330, 1250, 1200, 1160, 1100, 1080, 1060, 1005, 980, 950, 850, 780, 740 $cm^{-1}$ and absorption spectrum as shown in FIG. 2 as determined using the KBr tablet method,
Color reactions:
Positive: ninhydrin and Lemieux .
Negative: Sakaguchi and ferric chloride
Color and form: yellow powder
Solubility: soluble in methanol, ethanol, acetone and water, and insoluble in ether, n-hexane and petroleum ether
Specific rotation:
$[\alpha]_D^{25} = -77.8$ (C=1, methanol)
Stability: stable at a pH of 2 to 6
Rf values in thin-layer chromatography (silica gel):
Chloroform-methanol (4:1) 0.73
n-Butanol-acetic acid-water (2:1:1) 0.64
Distinction among acidity, neutrality and basicity: basic.

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**4,298,600**

## ANTIBIOTIC C-14482 $A_1$ AND METHOD FOR PRODUCING SAME

**Eiji Higashide, Takarazuka; Seiichi Tanida, Kyoto; Masayuki Muroi, Naganohigashi, and Mitsuko Asai, Takatsuki, all of Japan, assignors to Takeda Chemical Industries, Ltd., Japan**

**Filed Aug. 2, 1978, Ser. No. 930,317**
**Claims priority, application Japan, Aug. 4, 1977, 52-93875**
**Int. Cl.[3] C12P** *1/04*
**U.S. Cl. 424—120** **2 Claims**

1. Antibiotic C-14482 $A_1$ which has the following properties:
(I) Elemental analysis: (%) C, 58.02, 59.18; H, 5.84, 5.70; N, 16.32, 17.14;
(II) Melting point: Not less than 300° C.
(III) Specific rotation: $[\alpha]_D^{24.5} + 150° \pm 30°$ (c=0.05, ethanol)
(IV) Ultraviolet absorption spectrum:
$\lambda_{max}^{MeOH}$ ($E_{1cm}^{1\%}$) 214 nm±2(503±50)
$\lambda_{max}^{MeOH}$ ($E_{1cm}^{1\%}$) 281 nm±2(209±10)
$\lambda_{max}^{MeOH}$ ($E_{1cm}^{1\%}$) 498 nm±2(46.0±5)
(V) Infrared absorption spectrum (KBr): Principal peaks ($cm^{-1}$) 3430, 3175, 2940, 2890, 2850, 1680, 1650, 1625, 1600, 1455, 1390, 1345, 1250, 1170, 1140, 1110, 1075, 1025, 995, 935, 910, 825
(VI) Solubility:
Practically insoluble: Hexane, petroleum ether
Sparingly soluble: Ethanol, butanol, ethyl acetate, water
Soluble: Methanol, chloroform
(VII) Color reactions: Negative: Sakaguchi reaction, Barton reaction, Potassium permanganate declorized,
(VIII) Acidity, neutrality or basicity: Weakly basic,
(IX) Color of crystals: Dark red to reddish brown,
(X) Molecular weight: $4.6 \times 10^2$ (measured by Vapor pressure osmometry in $CH_3COOC_2H_5$).

2. A method for producing Antibiotic C-14482 $A_1$ which comprises cultivating a microorganism which belongs to the genus Nocardia sp. No. C-14482 (ATCC-31309) and is capable of producing Antibiotic C-14482 $A_1$ in a culture medium, whereby Antibiotic C-14482 $A_1$ is elaborated and accumulated in said culture medium and recovering the antibiotic.

**4,298,601**

## METHOD AND FORMULATIONS FOR THE TREATMENT OF OBESITY

**Alan N. Howard, Cambridge, England, assignor to Technutra, S.A., Luxembourg**

**Continuation of Ser. No. 693,599, Jun. 7, 1976, abandoned, which is a division of Ser. No. 338,257, Mar. 5, 1973, Pat. No. 4,009,265. This application Jul. 24, 1978, Ser. No. 927,494**
**Claims priority, application United Kingdom, Mar. 6, 1972, 10439/72**
**The portion of the term of this patent subsequent to Feb. 22, 1994, has been disclaimed.**
**Int. Cl.[3] A01N** *9/00, 9/28;* **A23L** *1/30;* **A23J** *3/00*
**U.S. Cl. 424—128** **42 Claims**

1. A dietary formulation for the treatment of obesity in man, which comprises:
(a) all the minerals required by man;
(b) material which is a source of aminoacids selected from at least one member of the class consisting of:
(i) a mixture of monomeric L-aminoacids, and
(ii) natural proteins, and
(iii) natural proteins reinforced with at least one monomeric L-aminoacid;
and (c) digestible carbohydrate;
characterized in that a smallest amount of the dietary formulation containing at least the minimum daily requirements of each of the minerals required by man, including at least 800 mg calcium, 800 mg phosphorus, 140 μg iodine, 10 mg iron and 350 mg magnesium, also contains
(A) at least 15 g of said material which must include at least the minimum daily requirements for man of all the essential L-aminoacids required by man; and
(B) from 15 g to 75 g of said carbohydrate;
and further characterized in that the total caloric value of said smallest amount of the dietary formulation is in the range of from 160 Kcals to 600 Kcals.

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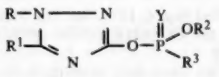
**4,298,602**

## HETEROCYCLIC SUBSTITUTED TRIAZOLYL PHOSPHOROUS COMPOUNDS AND THEIR USE AS INSECTICIDES

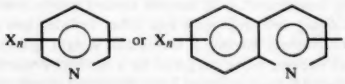
**Chester E. Pawloski, Bay City, Mich., assignor to The Dow Chemical Company, Midland, Mich.**

**Continuation-in-part of Ser. No. 951,923, Oct. 13, 1978, abandoned. This application Oct. 15, 1979, Ser. No. 84,697**
**Int. Cl.[3] C07D** *213/02, 215/02*
**U.S. Cl. 424—200** **66 Claims**

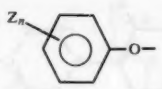
1. A compound corresponding to the



wherein R represents a nitrogen containing heterocyclic radical corresponding to one of the formulae



each X independently represents chloro, fluoro, bromo, nitro, alkyl of 1 to 4 carbon atoms, amino, mono- or dialkylamino wherein each alkyl group independently contains from 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms, alkylsulfinyl of 1 to 4 carbon atoms, alkylsulfonyl of 1 to 4 carbon atoms, cyano, trifluoromethyl, trichloromethyl, phenoxy or substituted phenoxy of the formula



wherein each Z independently represents chloro, fluoro, bromo, nitro, cyano, alkoxy of 1 to 4 carbon atoms or alkylthio of 1 to 4 carbon atoms, with the proviso that when either n is 2 or 3, all X groups are sterically compatible with each other and all Z groups are sterically compatible with each other; Y represents oxygen or sulfur; each n can independently represent an integer of from 0 to 3, inclusive; $R^1$ represents hydrogen, chloro, fluoro, bromo, alkyl of 1 to 4 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, phenyl, phenylthio, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms, alkylsulfinyl of 1 to 4 carbon atoms, alkylsulfonyl of 1 to 4 carbon atoms, thiocyanato, trifluoromethyl, trichloromethyl, amino, mono- or dialkylamino wherein each alkyl group independently contains from 1 to 4 carbon atoms; $R^2$ represents methyl, ethyl, propyl or isobutyl and $R^3$ represents methoxy, ethoxy, propoxy, ethyl, mono- or dialkylamino wherein each alkyl group independently contains from 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms or phenyl.

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**4,298,603**

## O-AMINOALKYLSALICYLATES

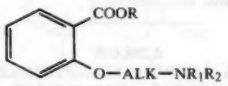
**Ching-Te Chang, Taipei, and Tsung-Tsan Su, Hsinchu, both of Taiwan, assignors to Industrial Technology Research Institute, Taiwan**

**Filed Dec. 6, 1979, Ser. No. 100,891**

**Int. Cl.³ A61K** *31/615;* **C07C** *101/42*

**U.S. Cl. 424—230** **8 Claims**

**1**. A compound of the formula



I

wherein R is $C_4$–$C_{14}$ alkyl, ALK is a lower alkylene radical, $R_1$ and $R_2$ are the same or different and are hydrogen or lower alkyl, $R_1$ and $R_2$ taken together form a 5–7 atom ring which includes 1–2 nitrogen atoms, the other ring members being carbon atoms, and the pharmaceutically acceptable acid addition salts thereof.

**7**. A method for topical local anesthesia which comprises administering topically an effective amount of a compound or acid addition salt as defined in any one of claims **1** to **6** in the presence of an inert carrier.

**8**. A topical local anesthetic pharmaceutical composition comprising an effective amount of a compound or an addition salt as defined in any one of claims **1** to **6** and a pharmaceutically acceptable carrier.

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**4,298,604**

## CLOTRIMAZOLE-BETAMETHASONE DIPROPIONATE COMBINATION

**Susan B. Hammell, Berkeley Heights, N.J., assignor to Schering Corporation, Kenilworth, N.J.**

**Filed Oct. 6, 1980, Ser. No. 194,524**

**Int. Cl.³ A61K** *31/56, 31/58*

**U.S. Cl. 424—240** **6 Claims**

**1**. A pharmaceutical composition comprising about 0.001 to about 0.33 percent by weight betamethasone dipropionate and about 0.01 to about 10 percent by weight clotrimazole, wherein the ratio of clotrimazole to betamethasone dipropionate ranges from about 10 to about 30 to 1, in a pharmaceutically acceptable carrier.

**4,298,605**

## CEPHALOSPORIN DERIVATIVES

**Nobuhiro Oi, Hoya; Bunya Aoki, Tama; Teizo Shinozaki, Matsudo; Kanji Moro, Kuki; Isao Mat..unaga; Takao Noto, both of Tokyo; Toshiyuki Nebashi, Kawagoe; Yusuke Harada, Tokyo; Hisao Endo, Yokohama; Takao Kimura, Chiba; Hiroshi Okazaki, Sayama; Haruki Ogawa, Chofu, and Minoru Shindo, Tokyo, all of Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan**

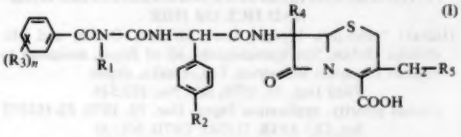
**Filed Jun. 11, 1979, Ser. No. 47,781**

**Claims priority, application Japan, Jun. 22, 1978, 53-74868; Sep. 11, 1978, 53-110627; Apr. 26, 1979, 54-50841**

**Int. Cl.³ C07D** *501/36*

**U.S. Cl. 424—246** **9 Claims**

**1**. A cephalosporin derivative represented by the formula



(I)

wherein $R_1$ is a hydrogen atom or a lower alkyl group; $R_2$ is a hydrogen atom or a hydroxyl group; $R_3$ is a hydroxyl group or a lower alkanoyloxyl group; n is 2 or 3; at least two of $R_3$ are bonded to adjacent carbon atoms, the position of substituent $R_3$ being selected from 3 to 5 position when $R_1$ is a lower alkyl group and $R_3$ is a hydroxyl group, and 2 to 6 position when $R_1$ and $R_3$ are other substituents; $R_4$ is a hydrogen atom; and $R_5$ is —S—$R_6$ (wherein $R_6$ is a five-membered heterocyclic ring selected from the group consisting of 1,3,4-thiadiazole, triazole and tetrazole, each of which is unsubstituted or substituted with a lower alkyl group) or a pharmaceutically acceptable salt thereof.

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**4,298,606**

## THIAZOLYLACETAMIDO COMPOUNDS

**Michihiko Ochiai, Osaka; Taiiti Okada, Kyoto; Osami Aki, Hyogo; Akira Morimoto; Kenji Kawakita, both of Osaka, and Yoshihiro Matsushita, Hyogo, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan**

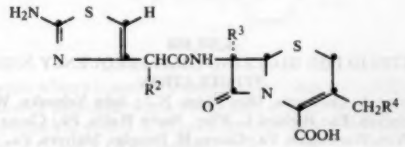
**Division of Ser. No. 900,233, Apr. 26, 1978, abandoned, which is a continuation-in-part of Ser. No. 642,356, Dec. 19, 1975, Pat. No. 4,098,888. This application Aug. 28, 1979, Ser. No. 71,032**

**Int. Cl.³ C07D** *501/20*

**U.S. Cl. 424—246** **20 Claims**

**1**. A member selected from the group consisting of

(a) a cephem compound of the formula



wherein $R^2$ represents amino, hydroxy or the group

represents a group of the formula

wherein $R^5$ is hydroxy or lower alkoxy, $R^3$ represents hydrogen or methoxy, and $R^4$ represents hydrogen or acetoxy,

(b) a pharmaceutically acceptable salt thereof, and

(c) a pharmaceutically acceptable ester of the 4-position carboxy group selected from the group consisting of alkoxymethyl, α-alkoxyethyl, α-alkoxy-α-substituted methyl, alkylthiomethyl, pivaloyloxymethyl and α-acetoxybutyl esters.

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**4,298,607**

## CRYSTALLINE SALT OF 7β-[2-(2-AMINOTHIAZOL-4-YL)-(Z)-2-METHOXYIMINOACETAMIDO]-3-[(1-METHYL-1H-TETRAZOL-5-YL)THIOMETHYL]CEPH-3-EM-4-CARBOXYLIC ACID AND HCL OR HBR

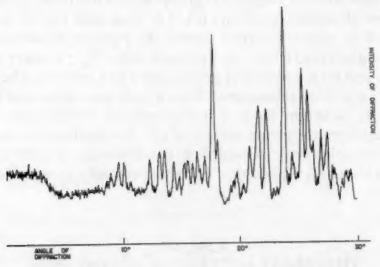
**Hideaki Natsugari, Hyogo; Iwao Mikami, Osaka, and Michihiko Ochiai, Senriyamahigashi, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan**

**Filed Dec. 11, 1979, Ser. No. 102,525**

**Claims priority, application Japan, Dec. 11, 1978, 53-153377**

**Int. Cl.³ A61K *31/545;* C07D *501/56***

**U.S. Cl. 424—246** **2 Claims**



**1**. A crystalline hemi-acid salt which salt comprises 7β-[2-(2-aminothiazol-4-yl)-(Z)-2-methoxyiminoacetamido]-3-[(1-methyl-1H-tetrazol-5-yl)thiomethyl]ceph-3-em-4-carboxylic acid and HCl or HBr, of which the HCl or HBr content is a half mole per one mole of the former carboxylic acid.

**2**. An antibiotic composition in solid form which comprises a crystalline hemi-acid salt as defined in claim **1** and a nontoxic alkali salt selected from the group consisting of sodium carbonate, sodium hydrogen carbonate and trisodium phosphate.

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**4,298,608**

## METHOD FOR BLOCKING HIGH FREQUENCY NERVE STIMULATION

**George A. Condouris, Glen Ridge, N.J.; John Yelnosky, Warrington, Pa.; Richard L. Riley, North Wales, Pa.; Chong M. Won, Warrington, Pa.; George H. Douglas, Malvern, Pa., and William L. Studt, Harleysville, Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.**

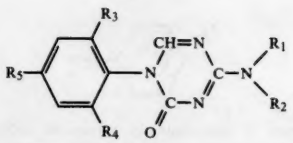
**Continuation of Ser. No. 959,858, Nov. 13, 1978, Pat. No. 4,198,408. This application Apr. 11, 1980, Ser. No. 139,484**

**The portion of the term of this patent subsequent to Apr. 15, 1997, has been disclaimed.**

**Int. Cl.³ A61K *31/53***

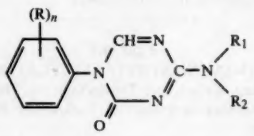
**U.S. Cl. 424—249** **4 Claims**

**1**. A method which comprises selectively blocking the conduction of high frequency nerve impulses without substantially affecting the transmission of single impulse nerve conduction by exposing living nerve fiber to an effective amount of a compound of the formula



wherein $R_1$ and $R_2$ are each lower alkyl, hydrogen, aralkyl, hydroxy lower alkyl or lower alkoxy; $R_3$ and $R_4$ are each separately lower alkyl of 1 to 6 carbon atoms or halo and $R_5$ is hydrogen, halo, lower alkyl, lower alkenyl, lower alkoxy or hydroxy lower alkyl; with the proviso that the total number of carbon atoms in $R_1$, $R_2$, $R_3$ and $R_4$ taken together is at least four and no more than about 20; together with the pharmaceutically acceptable salts thereof.

**4**. A method for treating physiological disorders in mammalian species characterized by aberrant high frequency discharge of nerve fiber which comprises modifying the nerve impulse conductivity by administering to a patient in need of such therapy an effective amount of a compound of the formula:



wherein $R_1$ and $R_2$ are each lower alkyl, aralkyl, hydroxy lower alkyl of lower alkoxy; R is each separately lower alkyl of 1 to 6 carbon atoms, halo, lower alkenyl, lower alkoxy or hydroxy lower alkyl; and n is 1–3; together with the pharmaceutically acceptable salts thereof.

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**4,298,609**

## 4,5-DIHYDRO-6-(4-PYRIDINYL)-3-PYRIDAZINOL AND SALTS, THEIR PREPARATION AND USE AS BLOOD PRESSURE LOWERING AGENTS

**George Y. Lesher, Schodack, and William B. Dickinson, Albany, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.**

**Filed Aug. 30, 1979, Ser. No. 71,064**

**Int. Cl.³ A61K *31/50;* C07D *237/22***

**U.S. Cl. 424—250** **7 Claims**

**1**. The method for lowering blood pressure in a patient having elevated blood pressure which comprises administering orally or parenterally in a solid or liquid dosage form to such patient a blood pressure lowering effective amount of 4,5-dihydro-6-(4-pyridinyl)-3-pyridazinol or pharmaceutically-acceptable acid-addition salt thereof.

**2**. 4,5-Dihydro-6-(4-pyridinyl)-3-pyridazinol or pharmaceutically-acceptable acid-addition salt thereof.

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**4,298,610**

## ESTER DERIVATIVES OF QUINOLOPYRAN-4-ONE-2-CARBOXYLIC ACIDS AND ANTIALLERGIC ANTASTHMATICS

**Yasuhiro Morinaka, Ami, and Kazuo Takahashi, Ibaragi, both of Japan, assignors to Mitsubishi Yuka Pharmaceutical Co., Ltd., Tokyo, Japan**

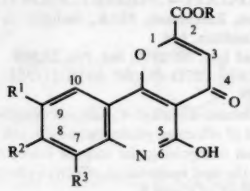
**Filed May 30, 1979, Ser. No. 43,906**

**Claims priority, application Japan, Jun. 5, 1978, 53/67448**

**Int. Cl.³ C07D *491/04;* A61K *31/47***

**U.S. Cl. 424—256** **9 Claims**

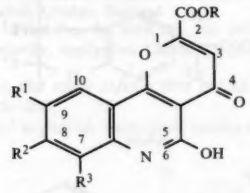
**1**. An ester derivative of quinolopyran-4-one-2-carboxylic acids which is represented by the formula [I] or a tautomer thereof




[I]

wherein, $R^1$, $R^2$ and $R^3$ each stand for hydrogen, an alkyl group having 1 to 5 carbon atoms, an alkoxyl group having 1 to 5 carbon atoms, benzyloxy group, a halogen atom, an alkoxycarbonyl group having 2 to 6 total carbon atoms, an aryl group having 6 to 10 carbon atoms, or an alkylenedioxy group having 1 to 3 carbon atoms formed by two alkoxyl groups which are selected from $R^1$, $R^2$ and $R^3$ and bonded together, respectively; and R is an alcohol residue having 5 or 6 carbon atoms selected from the group consisting of 3-methyl-1-butyl, 2-methyl-1-butyl, 2,2-dimethyl-1-propyl, 2-pentyl, 3-pentyl, n-hexyl, 4-methyl-1-pentyl, 2-methyl-1-pentyl, 3-methyl-1-pentyl, 4-methyl-2-pentyl, 2-hexyl, 3-hexyl, and 3-methyl-2-pentyl.

5. An antiallergic composition for asthma which comprises an effective amount for the treatment of allergic asthma of an ester derivative of quinolopyran-4-one-2-carboxylic acids represented by the general formula [I] or a tautomer of the ester derivative,




[I]

wherein $R^1$, $R^2$ and $R^3$ each stand for hydrogen, an alkyl group having 1 to 5 cargon atoms, an alkoxy group having 1 to 5 carbon atoms, benzyloxy group, a halogen atom, an alkoxycarbonyl group having 2 to 6 total carbon atoms, an aryl group having 6 to 10 carbon atoms, or an alkylenedioxy group having 1 to 3 carbon atoms formed by two alkoxyl groups which are selected from $R^1$, $R^2$ and $R^3$ and bonded together, respectively; and R is an alcohol residue having 5 or 6 carbon atoms selected from the group consisting of 3-methyl-1-butyl, 2-methyl-1-butyl, 2,2-dimethyl-1-propyl, 2-pentyl, 3-pentyl, n-hexyl, 4-methyl-1-pentyl, 2-methyl-1-pentyl, 3-methyl-1-pentyl, 4-methyl-2-pentyl, 2-hexyl, 3-hexyl and 3-methyl-2-pentyl; and a pharmaceutically acceptable carrier.

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**4,298,611**

## PROCESS FOR REDUCING BLOOD PRESSURE IN ANIMALS

**John D. Fernstrom, Boston, and Alan F. Sved, Brighton, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.**

**Filed Apr. 24, 1978, Ser. No. 898,741**
**Int. Cl.³ A61K *31/48***
**U.S. Cl. 424—261** **2 Claims**

1. The process for reducing blood pressure in an animal suffering from high blood pressure which comprises administering a compound selected from the group consisting of 2-chloro-6-methylergoline-8Beta-acetonitrile, a pharmaceutically acceptable salt of 2-chloro-6 -methylergoline-8Beta-acetonitrile, and mixtures thereof to the animal in an amount effective to reduce blood pressure.

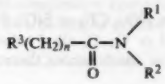
**4,298,612**

## INSECT REPELLENTS

**Terrence P. McGovern, Bowie, Md., and Carl E. Schreck, Gainesville, Fla., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.**

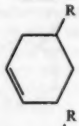
**Division of Ser. No. 8,814, Feb. 2, 1979. This application May 18, 1979, Ser. No. 40,253**
**The portion of the term of this patent subsequent to Sep. 22, 1998, has been disclaimed.**
**Int. Cl.³ A01N *43/40***
**U.S. Cl. 424—267** **9 Claims**

1. A method of repelling stable flies, black flies, deer flies, sand flies, and mosquitoes comprising applying to the skin or to clothing an effective insect repellent amount of a compound of the formula




wherein $R^3$ is one of the groups A, B, or C

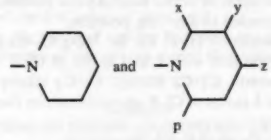
(A)




(B)

(C)

R is hydrogen or lower alkyl, and n is the positive integer one, two, or three and $R^1$ and $R^2$ taken together with the N is selected from the group consisting of




wherein when x is methyl, y and z are hydrogen, and p is either methyl or hydrogen; when y is methyl, x, z, and p are hydrogen; when z is methyl, x, y, and p are hydrogen; and when x is ethyl, y, z, and p are hydrogen.

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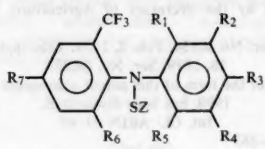
**4,298,613**

## AGRICULTURAL HETEROCYCLIC SULFENAMIDES

**Gerald E. Lepone, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed May 5, 1980, Ser. No. 146,418**
**Int. Cl.³ A61K *31/40*; C07D *209/48, 207/24***
**U.S. Cl. 424—274** **40 Claims**

1. A compound of the formula



wherein

$R_1$, $R_3$, and $R_4$ are independently H, F, Cl, Br, $NO_2$, $CF_3$, $OCF_2H$, $OCF_3$, $OCF_2CF_2H$ or $S(O)_kR_8$; or $R_3$ and $R_4$ can be taken together to form $—OCF_2O—$ or $—OCF_2OCF_2—$;

$R_2$ is H, F, Cl, Br, $NO_2$, $CF_3$ or $S(O)_kR^8$;

$R_8$ is $C_1$–$C_2$ alkyl or $C_1$–$C_2$ alkyl substituted with 2 to 4 atoms of Cl, F or combinations thereof;

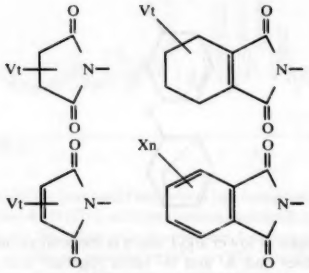
k=0, 1 or 2;

$R_5$ is H, Cl, F, Br or $NO_2$;

$R_6$ is H, $NO_2$, or $CF_3$;

$R_7$ is $NO_2$ or $CF_3$;

Z is



where

bonding to sulfur is to the heterocyclic portion of Z and X can be bonded to any ring position;

X is independently H, F, Cl, Br, $NO_2$, $C_1$–$C_4$ alkyl, $C_1$–$C_4$ alkyl substituted with 2 to 4 atoms of Cl, F or combinations thereof, $C_1$–$C_4$ alkoxy, $C_1$–$C_4$ alkoxy substituted with 2 to 4 atoms of Cl, F or combinations thereof, CN, or $NR_{10}R_{11}$;

V is H, $C_1$–$C_4$ alkyl F, Cl, Br;

n is 1, 2, 3 or 4;

t is 1 or 2;

$R_{10}$ and $R_{11}$ are $C_1$–$C_4$ alkyl;

provided that

(1) at least two of $R_1$, $R_2$, $R_3$, $R_4$ and $R_5$ are hydrogen;

(2) no more than two of the substituents $R_1$, $R_2$, $R_3$ and $R_4$ are simultaneously $NO_2$ or $CF_3$;

(3) when two $NO_2$ or two $S(O)_kR_8$ groups are present, they are not ortho to one another;

(4) $R_6$ and $R_7$ are not simultaneously $CF_3$;

(5) no more than two of the X substituents are CN, $NO_2$ or alkoxy;

and further provicded that when $R_6$ is $NO_2$, then

(a) $R_1$ is H, F or Cl when $R_3$ is other than H, F or Cl;

(b) when $R_1=R_3=R_5$, then $R_1$, $R_3$ and $R_5$ are either H or F; and

(c) $R_5$ is either H or F.

**4,298,614**

## 5'-AMINOALKYL-4',4-DIALKYLPSORALENS

**Kurt D. Kaufman, Kalamazoo, Mich., assignor to Thomas C. Elder, Inc., Hamilton, Ind.**

**Filed Sep. 10, 1979, Ser. No. 73,908**

**Int. Cl.**[3] **C07D** *493/04;* **A61K** *31/365*

**U.S. Cl. 424—279** **6 Claims**

**1**. 5'-primaryaminoloweralkyl-4',4-diloweralkylpsoralen.

**3**. The method of effecting photochemical sensitivity on the skin of a mammal comprising the step of orally or topically administering to the said mammal an effective photosensitizing dose of a compound of claim **1**.

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**4,298,615**

## SUBSTITUTED 2,3-DIHYDROBENZOFURYLMETHYL ESTERS, THEIR USE IN PEST CONTROL, AND PEST CONTROL AGENTS CONTAINING THESE COMPOUNDS

**Gerd-Ulrich Schwarz, Mannheim; Kari Kiehs, Lampertheim; Walter Boell, Dannstadt-Schauernheim, and Heinrich Adolphi, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany**

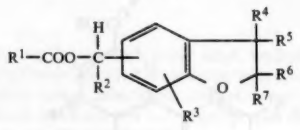
**Filed Jul. 28, 1980, Ser. No. 172,526**

**Claims priority, application Fed. Rep. of Germany, Aug. 4, 1979, 2931672**

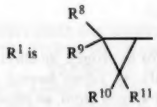
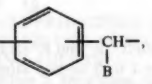
**Int. Cl.**[3] **A01N** *43/08;* **C07D** *307/82, 307/79*

**U.S. Cl. 424—285** **3 Claims**

**1**. A substituted 2,3-dihydrobenzofurylmethyl ester of the formula



where

$R^1$ is  or  ,

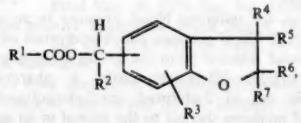
where

$R^8$ is hydrogen or alkyl of up to 5 carbon atoms, $R^9$ is alkyl, haloalkenyl or haloalkynyl, each of up to 5 carbon atoms, $R^{10}$ is halogen or alkyl of up to 5 carbon atoms, $R^{11}$ is halogen or alkyl of up to 5 carbon atoms, A is halogen, alkyl, alkoxy, trihaloalkyl or trihaloalkoxy, each of up to 5 carbon atoms, cyano or nitro, B is alkyl, alkenyl or alkynyl, each of up to 4 carbon atoms, or an alicyclic radical of 3 to 7 carbon atoms and n is from 0 to 3,

$R^2$ is hydrogen, cyano or alkyl, alkenyl or alkynyl, each of up to 5 carbon atoms, and

$R^3$, $R^4$, $R^5$, $R^6$ and $R^7$ are identical or different and each is hydrogen, halogen or alkyl, alkenyl, alkynyl or alkoxy, each of up to 5 carbon atoms.

**3**. A process for combating insects, ticks and mites, wherein an effective amount of at least one substituted 2,3-dihydrobenzofurylmethyl ester is allowed to act on the pests or their habitat, wherein said ester has the formula



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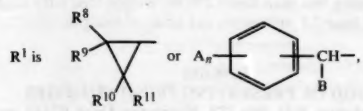
where



where

$R^8$ is hydrogen or alkyl of up to 5 carbon atoms, $R^9$ is alkyl, haloalkenyl or haloalkynyl, each of up to 5 carbon atoms, $R^{10}$ is halogen or alkyl of up to 5 carbon atoms, $R^{11}$ is halogen or alkyl of up to 5 carbon atoms, A is halogen, alkyl, alkoxy, trihaloalkyl or trihaloalkoxy, each of up to 5 carbon atoms, cyano or nitro, B is alkyl, alkenyl or alkynyl, each of up to 4 carbon atoms, or an alicyclic radical of 3 to 7 carbon atoms and n is from 0 to 3,

$R^2$ is hydrogen, cyano or alkyl, alkenyl or alkynyl, each of up to 5 carbon atoms, and

$R^3$, $R^4$, $R^5$, $R^6$ and $R^7$ are identical or different and each is hydrogen, halogen or alkyl, alkenyl, alkynyl or alkoxy, each of up to 5 carbon atoms.

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**4,298,616**

## FUNGICIDAL ACYLANILIDE COMPOUNDS

**Nazim Punja, Crowthorne, and William G. Rathmell, Wokingham, both of England, assignors to Imperial Chemical Industries Limited, London, England**

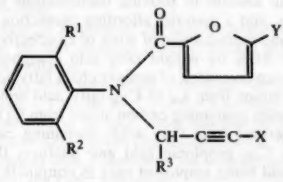
**Filed Oct. 16, 1980, Ser. No. 197,681**

**Claims priority, application United Kingdom, Nov. 2, 1979, 37968/79**

**Int. Cl.³ A01N** *43/08;* **C07D** *307/68, 307/73*

**U.S. Cl. 424—285** **6 Claims**

**1**. Alkynyl acylanilide derivatives having the formula:



wherein $R^1$ and $R^2$ are lower alkyl groups containing from 1 to 4 carbon atoms; $R^3$ is hydrogen or a lower alkyl group containing from 1 to 4 carbon atoms; X is hydrogen or halogen; and Y is halogen, nitro or an alkoxy group containing from 1 to 4 carbon atoms.

**4**. A process for combating pests which comprises applying to plants or seeds, or to their loci, a pesticidally effective amount of an acylanilide derivative as defined in any of claims **1** to **3**.

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**4,298,617**

## SYMMETRICAL AND ASYMMETRICAL SULFINYL-DICARBAMATES

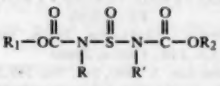
**Mohamed A. H. Fahmy, and Tetsuo R. Fukuto, both of Riverside, Calif., assignors to Regents of University of California, Los Angeles, Calif.**

**Filed Mar. 7, 1979, Ser. No. 18,414**

**Int. Cl.³ A01N** *37/28;* **C07C** *83/10*

**U.S. Cl. 424—298** **31 Claims**

**1**. Carbamates having pesticidal activity of the formula:



wherein R and R′ are each a hydrocarbyl group containing 1 to 12 carbon atoms, and R and R′ can be the same or different; $R_1$ is selected from the class consisting of a hydrocarbyl group containing from 1 to 20 carbon atoms, and a group containing the >C=N— radical; and $R_2$ can be other than $R_1$ and selected from the class consisting of a hydrocarbyl group containing from 1 to 20 carbon atoms; or $R_2$ can be the same as $R_1$.

**6**. Symmetrical carbamates as defined in claim **1**, wherein R and R′ are phenyl or substituted phenyl, and $R_1$ and $R_2$ are alkyl groups containing from 1 to 10 carbon atoms, and wherein $R_1$ and $R_2$ are the same, and R and R′ are the same.

**26**. An insecticidal composition comprising an insecticidally effective amount of a carbamate as defined in claim **1**, in admixture with a carrier.

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**4,298,618**

## METHOD OF MAKING CHEESE HAVING ZONES OF DIFFERENT CHARACTERISTICS

**Harold J. Peterson, Dodgeville, Wis., assignor to Farmers Pride Cheese, Inc., Arena, Wis.**

**Filed Apr. 23, 1980, Ser. No. 143,027**

**Int. Cl.³ A23G** *19/02*

**U.S. Cl. 426—36** **3 Claims**

**1**. A method for making cheese having discrete zones exhibiting contrasting characteristics comprising:

(a) filling a cheese vat with milk,

(b) dividing the vat into parts of selected relative size and preventing free fluid interchange between the parts by inserting a partition of solid, substantially fluid-impervious material within the vat in close engagement with the inside surface of the vat,

(c) treating the milk in each of the parts in distinctive manners selected to cause cheese made from the milk of one part to exhibit selected characteristics differing from those exhibited by cheese made from the milk of another part,

(d) treating the milk of each part to form a mass of curd and whey, the curd in each part exhibiting distinctive, selected characteristics,

(e) unifying the interior of the vat after formation of the curd by removing the partition from the vat,

(f) cutting the curd of each part with curd knives to produce pieces of curd of selected sizes, and

(g) stirring the pieces of curd at least until the pieces of curd from all parts of the vat are mixed throughout the vat.

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**4,298,619**

## PRODUCTION OF FOODS AND DRINKS CONTAINING BIFIDOBACTERIA

**Masahiko Mutai, Higashi Yamato; Mitsuo Mada, Kodaira, and Kiyohiro Shimada, Kunitachi, all of Japan, assignors to Kabushiki Kaisha Yakult Honsha, Tokyo, Japan**

**Filed Feb. 8, 1980, Ser. No. 119,774**

**Claims priority, application Japan, Feb. 23, 1979, 54-19724**

**Int. Cl.³ A23C** *9/12;* **A23L** *2/02*

**U.S. Cl. 426—43** **9 Claims**

**1**. A method of producing foods and drinks containing bifidobacteria by inoculating and cultivating bifidobacteria or a mixture of bifidobacteria and lactic acid bacteria in a medium consisting essentially of 10 to 20 percent by weight α-starch-transformed rice, which rice has been transformed by cooking, and bifidobacteria-fermentable sugars in an amount of 1–5 percent of the total weight of the medium to produce a bifidobacteria-containing medium having a bifidobacteria cell count of at least $10^7$ cells/ml., and preparing a food or drink from said bifidobacteria-containing medium.

4,298,620

## TEAR GRASS FERMENTATION PRODUCT, AND PROCESS

Yoshihide Hagiwara, Takarazuka, Japan, assignor to Japan Natural Food Co. Ltd., Osaka, Japan

Filed Jan. 3, 1980, Ser. No. 109,213
Claims priority, application Japan, Jan. 8, 1979, 54-129
Int. Cl.[3] A23L *1/28*
U.S. Cl. 426—44 5 Claims

1. A fermentation product consisting essentially of the product of fermentation of the water extract of tear grass, or said extract and at least one member selected from the group consisting of animal milks, condensed milk, skim milk, whey, juices of green leaves of barley, a dried product thereof, starch, lactose, sucrose, yeast extract, malt extract, fruit juices and water extracts of cereal germ, with a Lactobacillus strain.

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4,298,621

## CONVERTING ANIMAL WASTES TO USEFUL PRODUCTS

James M. Samis, Oklahoma City; Walter C. Waechter, Edmond, and Ronald D. James, Oklahoma City, all of Okla., assignors to Thermonetics, Inc., Oklahoma City, Okla.

Filed Jun. 9, 1980, Ser. No. 157,785
Int. Cl.[3] A23K *1/00*
U.S. Cl. 426—55 12 Claims

1. A process for simultaneously converting swine, poultry and cattle wastes to useful products comprising the steps of:

(a) combining water with said poultry and cattle wastes to form a mixed first slurry thereof;

(b) separating feathers from said first slurry;

(c) combining said swine wastes with said first slurry to form a mixed second slurry containing cattle wastes in the range of about 5% to about 30% by weight of the total fermentable solids;

(d) removing grit from said second slurry;

(e) subjecting said second slurry to anaerobic fermentation for a period of time such that a significant portion of the solid waste materials in said second slurry are converted to a methane-containing gas stream and such that a third slurry is produced containing a partially fermented solid residue;

(f) separating said methane-containing gas stream from said third slurry;

(g) separating partially fermented solid residue from said third slurry forming a solid residue portion and a remaining portion of said third slurry; and

(h) drying said partially fermented solid residue to form a feed product therefrom.

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4,298,622

## METHOD FOR PRODUCING WHEAT GERM LIPID PRODUCTS

Laxman Singh, Calumet City, Ill., and Wayne K. Rice, Wanatah, Ind., assignors to Vitamins, Inc., Chicago, Ill.

Filed Apr. 3, 1979, Ser. No. 26,749
Int. Cl.[3] A23L *1/277, 1/30*
U.S. Cl. 426—254 15 Claims

1. A method of producing improved wheat germ oil which comprises:

degumming wheat germ oil by mixing said oil with about 0.2 to 1.0% by weight of $H_3PO_4$ and sufficient water to hydrate the gums present in said oil, holding said mixture at a temperature between 40° and 80° C. for 30–180 minutes, and centrifuging said treated oil to separate gums;

bleaching said degummed oil by mixing said oil with from about 2 to about 10% by weight of an adsorbant, holding said mixture at a temperature between 90° and 110° C. for between 30 minutes and 120 minutes under substantial vacuum, and separating said adsorbant from the treated oil;

molecularly distilling said bleached oil in a centrifugal molecular still at 140°–200° C. and a pressure below 50 millitorr to remove odor bodies and fatty acids therefrom; and

recovering, as still bottoms, an improved wheat germ oil containing less than about 2% by weight free fatty acids and at least 2.5 milligrams per gram of tocopherols.

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4,298,623

## METHOD OF PRESERVING FRESH CHERRIES

Lyle K. Anderson, P.O. Box 354, Warrenton, Oreg. 97146, and Harold B. Allen, Rt. 2, Box 110, Astoria, Oreg. 97103

Filed Dec. 14, 1979, Ser. No. 103,429
Int. Cl.[3] A23B *7/08, 7/10*
U.S. Cl. 426—335 10 Claims

1. A method of processing cherries which comprises collecting cherries in a fresh, uncooked condition, and immersing said fresh, uncooked cherries for storage purposes, without pretreatment with sulfur dioxide or derivatives thereof, in an aqueous storage solution made up of an edible acid and dissolved sugar, the acid in said solution having sufficient concentration to inhibit bacterial growth and the sugar solute in the solution inhibiting osmotically produced change in cherry appearance.

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4,298,624

## PROTECTION AGAINST MITE CONTAMINATION

Jeffrey S. Mehring, Battle Creek; Ronald J. Sayen, Portage; Robert E. Schara, Battle Creek; Charles T. Stocker, Augusta, all of Mich., and Juan G. Rodriguez, Lexington, Ky., assignors to General Foods Corp., White Plains, N.Y.

Continuation of Ser. No. 680,305, Apr. 26, 1976, abandoned, which is a continuation of Ser. No. 338,020, Mar. 5, 1973, abandoned, which is a continuation of Ser. No. 81,617, Oct. 16, 1970, abandoned. This application Jul. 20, 1977, Ser. No. 817,382
Int. Cl.[3] A23K *3/00;* A23L *3/34*
U.S. Cl. 426—532 8 Claims

1. A food composition having a moisture content of about 15 to 50% by weight comprised of a comestible material normally capable of supporting bacteriological growth, water soluble solutes in an amount to provide bacteriostasis to said food composition, and a material affording protection against the infestation and reproduction of mites of an effective amount of from 1.0 to 3.0% by weight fatty acid component selected from the group consisting of straight chain fatty acids containing carbon atoms from $C_4$ to $C_{10}$, fatty acid amides derived from fatty acids containing carbon atoms from $C_3$ to $C_{10}$, fatty acid salts derived from fatty acids containing carbon atoms from $C_3$ to $C_{10}$, propionic acid and mixtures thereof, said propionic acid being employed only in conjunction with said fatty acid, amide, ester or salt.

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4,298,625

## SWEET PROTEIN FOOD PRODUCT IN THE FORM OF A FOAMED PLASTIC MASS

Renzo Cillario, Alba, Italy, assignor to P. Ferrero & C. S.p.A., Alba, Italy

Filed May 6, 1980, Ser. No. 147,017
Claims priority, application Italy, Sep. 11, 1979, 68798 A/79
Int. Cl.[3] A23G *3/00*
U.S. Cl. 426—572 10 Claims

1. Sweet protein food product, in the form of a foamed plastic mass consisting essentially of an "oil in water" emulsion formed from edible fat, milk proteins, sugar and water, having a pH of from 6.2 to 7.5 and obtainable by a process comprising the steps of:

(a) preparing an "oil in water" emulsion at 55°–65° C. with 75–55% by weight of an aqueous phase comprising at least 70% by weight of partially-skimmed, sweetened condensed milk and 25–45% by weight of an oil phase comprising at least 98% by weight of at least one crystallizable edible fat, and in which:

the said condensed milk has a viscosity of from 2000 to 6000

cps at 20° C. and a variation in viscosity at 40° C. not exceeding 1500 cps after heating to 80° C. and subsequent cooling to 40° C.;

the protein content of the emulsion consists entirely of milk proteins including casein and serum protein;

the emulsion contains water in amounts from 17% to 35% by weight and the protein/water weight ratio is from about 12:100 to about 36:100;

(b) pasteurizing the said emulsion at a temperature of 90°–110° C. for a time not exceeding about 18 seconds while avoiding evaporation of the water content of the emulsion;

(c) rapidly cooling the pasteurized emulsion to 45°–55° C. and intimately seeding the pasteurized emulsion with lactose microcrystals added in a quantity at least 0.015% but not exceeding 1% by weight and foaming the seeded emulsion by means of the intimate incorporation of an inert gas;

(d) cooling the emulsion to a temperature not greater than 20° C. under mechanical beating for a sufficient length of time to produce crystallization of at least part of the edible fat content of the emulsion;

(e) packaging or storing the cooled emulsion under sterile conditions.

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**4,298,626**

## PRODUCTION OF AN ISO-α-ACID PREPARATION FROM HOPS

**Derek R. J. Laws, Bexley Heath; Nigel A. Bath, Kemsing; Colin S. Ennis, Chislehurst; John A. Pickett, Kimpton, and Alfred G. Wheldon, Galley Wood, all of England, assignors to Brewing Patents Limited, London, England**

**Continuation-in-part of Ser. No. 793,357, May 3, 1977, Pat. No. 4,212,895. This application Sep. 19, 1979, Ser. No. 76,949**

**Claims priority, application United Kingdom, Oct. 13, 1976, 42613/76**

**The portion of the term of this patent subsequent to Aug. 10, 1996, has been disclaimed.**

**Int. Cl.³ C12C** *3/00*

**U.S. Cl. 426—600** **2 Claims**

1. A method of making an iso-α-acid preparation, suitable for addition to beer without haze formation which method consists essentially of:

(i) extracting hops with liquid carbon dioxide at a temperature from −5° C. to 20° C., under a pressure sufficient to keep the carbon dioxide liquid but not so high that the carbon dioxide behaves like a supercritical fluid, thereby extracting at least a portion of the α-acid contained in the hops into the carbon dioxide;

(ii) evaporating off the liquid carbon dioxide under conditions such that the extract comes in contact only with equipment which is chemically inert to the extract, thereby recovering a primary hop extract of high purity consisting essentially of α-acids, β-acids, hop oil, and the following impurities: uncharacterized soft resins up to 3%; hard resins up to 0.5%; tannins up to 0.5%; chlorophyll up to 0.2%; fats and waxes up to 0.2%; fines up to 0.5% and inorganic salts up to 0.5%, the total impurities being up to 4% and said extracts being yellow;

(iii) preparing an alkaline aqueous solution containing the extract; and

(iv) boiling this solution to convert substantially all the α-acids present therein to iso-α-acids.

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**4,298,627**

## POTATO TREATS

**Hettie L. Rains, Rte. 2, Box 1022, Williamsburg, Ky. 40769**

**Continuation-in-part of Ser. No. 548,894, Feb. 11, 1975, abandoned. This application Jan. 11, 1977, Ser. No. 758,500**

**Int. Cl.³ A23L** *1/216*

**U.S. Cl. 426—637** **3 Claims**

1. A potato-based snack food having a crisp texture, tan color, natural potato taste, containing substantially all of the natural minerals and essentially devoid of the natural carbohydrates of potatoes, which consists essentially of fresh white potato peelings removed from potatoes, deep-fat fried in an edible oil at a temperature of about 325°–350° F. for a time sufficient to produce said crisp texture and tan color to said snack food.

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**4,298,628**

## METHOD FOR MANUFACTURING FRIED TOFU PRODUCTS

**Toshiyuki Nagata; Masahiko Terashima, and Kazuto Mashima, all of Osaka, Japan, assignors to Fuji Oil Company, Ltd., Osaka, Japan**

**Filed Aug. 14, 1979, Ser. No. 66,821**

**Claims priority, application Japan, Aug. 24, 1978, 53-103565**

**Int. Cl.³ A23J** *3/00*

**U.S. Cl. 426—656** **12 Claims**

1. A method for manufacturing a fried tofu product comprising:

kneading a mixture of a soy proteinaceous material containing a crude protein in an amount of 60% or more by weight relative to the weight of the dry solids thereof with water;

adding a salt or hydroxide of calcium or magnesium in an amount of 1% or more by weight relative to the weight of the crude protein, in such a manner as to avoid any possible water-release from the mixture;

shaping the mixture containing the calcium or magnesium compound into any desired shape; and

deep-frying the shaped mixture.

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**4,298,629**

## METHOD FOR FORMING A NITRIDE INSULATING FILM ON A SILICON SEMICONDUCTOR SUBSTRATE SURFACE BY DIRECT NITRIDATION

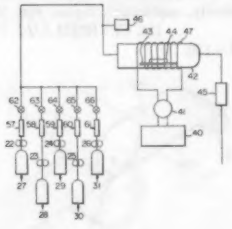
**Takao Nozaki, Yokohama; Takashi Ito, Kawasaki; Hideki Arakawa; Hajime Ishikawa, both of Yokohama, and Masaichi Shinoda, Sagamihara, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Filed Mar. 7, 1980, Ser. No. 128,172**

**Claims priority, application Japan, Mar. 9, 1979, 54-27301**

**Int. Cl.³ C23C** *11/00*

**U.S. Cl. 427—39** **30 Claims**



1. A method for forming an insulating film on the surface of at least one semiconductor silicon body, wherein the insulating film is formed of silicon nitride by direct nitridation in a direct nitridation reaction chamber, comprising

positioning each semiconductor body in the direct nitridation reaction chamber,

generating a gas plasma of a nitrogen containing gas in the direct nitridation reaction chamber, and

heating the semiconductor silicon body to a temperature of from approximately 800° to approximately 1300° C. within the gas plasma.

**4,298,630**

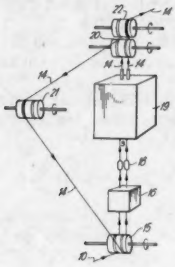
## METHOD OF MANUFACTURING ELECTRICALLY INSULATED CONDUCTORS WITH ULTRA-VIOLET CURED COATINGS

**Marek Kapuscinski, Montreal, and Michel Gervais, Verdun, both of Canada, assignors to Northern Telecom Ltd., Montreal, Canada**

**Continuation-in-part of Ser. No. 889,231, Mar. 23, 1978, abandoned. This application Sep. 17, 1979, Ser. No. 76,320**

**Int. Cl.³ B05D** *3/06*

**U.S. Cl. 427—44** **4 Claims**



4. A method for producing an electrically insulated conductor for a telecommunications cable comprising:

covering a conducting member with a layer of an uncured photopolymer by passing it through a bath of the photopolymer to provide a first coating, partially curing the first coating by ultra-violet light and then covering the first coating with a second coating;

partially curing the second coating of the layer of photopolymer with ultra-violet light;

applying a layer of pulp insulation directly over the partially cured photopolymer layer and further curing the photopolymer layer to cause a chemical bond to take place between the two layers at an interfacial region.

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**4,298,631**

## METHOD FOR SMOOTHING BOTH MAGNETIC COAT LAYERS OF MAGNETIC RECORDING MEDIUM

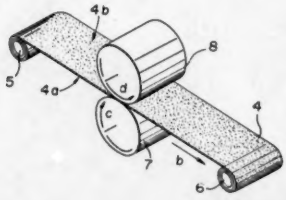
**Chiho Mikura, and Fujio Shibata, both of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan**

**Continuation-in-part of Ser. No. 20,063, Mar. 13, 1979, abandoned. This application Jun. 4, 1980, Ser. No. 156,405**

**Claims priority, application Japan, Apr. 10, 1978, 53-41855**

**Int. Cl.³ B05D** *5/12*

**U.S. Cl. 427—130** **3 Claims**



1. A method for simultaneously smoothing both magnetic coating layers of a recording medium having solid magnetic coatings disposed on both sides thereof, said method comprising:

winding on a feed roll, a recording medium including solid magnetic coatings disposed on both sides thereof;

disposing at least one pair of rigid rotary rolls positioned between said feed roll and a take-up roll, the rolls of each of said at least one pair having identical moduli of elasticity, said rolls of each of said at least one pair of rolls being contacted with a predetermined pressure;

unwinding said recording medium from said feed roll;

receiving said recording medium between said contacting rolls for smoothing said solid magnetic coatings; and

taking up said recording medium on said take-up roll, whereby calendar damage of said solid magnetic coatings is prevented.

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**4,298,632**

## SILICONE COATED ABRASION RESISTANT POLYCARBONATE ARTICLE

**Siegfried H. Schroeter, Schenectady, and Daniel R. Olson, Clifton Park, both of N.Y., assignors to General Electric Company, Pittsfield, Mass.**

**Division of Ser. No. 956,809, Nov. 1, 1978, Pat. No. 4,243,720. This application Aug. 17, 1979, Ser. No. 67,470**

**Int. Cl.³ B05D** *1/38, 5/00*

**U.S. Cl. 427—160** **6 Claims**

1. A process for providing a polycarbonate substrate with an abrasion and chemical solvent resistant thermoset organopolysiloxane coating consisting essentially of: (i) priming at least one surface of said substrate by applying onto said surface a primer composition consisting essentially of a thermoplastic acrylic polymer containing functional groups, said functional groups being selected from the group consisting of hydroxyl, carboxyl, amine, epoxide, amide, —SH, $-SO_3H$, —COOR, $-Si(OR^1)_3$, and mixtures thereof wherein R and $R^1$ are alkyl radicals containing from 1 to about 20 carbon atoms, and a solvent for said acrylic polymer; (ii) evaporating off the solvent from said primer composition thereby forming a solid primer layer consisting essentially of a thermoplastic acrylic polymer containing functional groups; (iii) applying onto the primer layer a top coat composition consisting of a solvent-soluble further-curable organopolysiloxane and a solvent therefor; (iv) evaporating off a substantial amount of the solvent in the top-coat composition; and (v) curing said further-curable organopolysiloxane thereby forming a hard, abrasion and chemical solvent resistant top-coat consisting of a thermoset organopolysiloxane which is tenaciously and durably adhered to the polycarbonate substrate.

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**4,298,633**

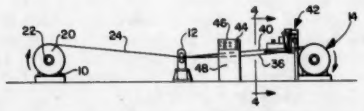
## METHOD AND APPARATUS FOR TENSIONING METALLIC STRIPS ON A SLITTING LINE

**Charles R. Bradlee, Sidney, Ohio, assignor to The Monarch Machine Tool Company, Sidney, Ohio**

**Filed Jun. 19, 1980, Ser. No. 161,186**

**Int. Cl.³ B05C** *9/10;* **B65H** *23/04*

**U.S. Cl. 427—172** **16 Claims**



1. In combination with a metal slitting operation including the steps of uncoiling a web having a non-uniform cross sectional thickness from a metal coil, slitting said web into a plurality of strips having varying thicknesses and recoiling said strips into individual strip coils, the method of tensioning strips comprising the step of:

depositing a flowable material onto thinner strips after said slitting step and hardening said material during said recoiling step such that said material is overlapped by successive windings of said thinner strips, the amount of flowable material deposited being such as to increase the effective cross sectional thickness of said thinner strips so that

all strip coils are of comparable diameter, thereby eliminating slackness in said strips.

7. An improved slitting line of the type having an uncoiler for uncoiling a metal web from a roll of coiled sheet metal having a non-uniform cross sectional thickness, a slitter for slitting said web into a plurality of strips having varying thicknesses, and a recoiler for recoiling said strips into individual strip coils, the improvement comprising:

means for depositing a flowable compound onto thinner strips so that the effective cross sectional thickness of said thinner strips is increased so that all strip coils are of comparable diameter, thereby eliminating slackness in said thinner strips between said slitter and said recoiler.

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**4,298,634**

## METHOD FOR COATING CYLINDRICAL SURFACES

**Edwin H. Phelps, Birmingham, Ala., assignor to Compagnie Internationale Pour l'Informatique CII-Honeywell Bull (Societe Anonyme), Paris, France**

**Filed Nov. 4, 1980, Ser. No. 204,049**
**Int. Cl.³ B05D *1/12, 7/22***
**U.S. Cl. 427—183** **19 Claims**

1. A method of coating the interior of a hollow cylindrical surface with a hydraulic cement comprising:

(a) depositing on the internal surface of said cylinder a composition comprising a substantially dry hydraulic cement, said cylinder being rotated about its longitudinal axis at a rate such that the centrifugal force generated thereby holds the cement composition substantially stationary at the point of deposition with respect to the said internal surface;

(b) applying to the said dry cement coated internal surface an aqueous composition containing an amount of water sufficient to substantially wet and harden said hydraulic cement; and

(c) continuing to rotate said cylinder until the said hydraulic cement coating has substantially hardened.

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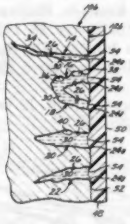
**4,298,635**

## CORROSION PROTECTION METHOD

**Roger Lovell, P.O. Box 981, Palacios, Tex. 77465**

**Division of Ser. No. 587, Jan. 2, 1979, Pat. No. 4,275,111, which is a continuation-in-part of Ser. No. 783,467, Mar. 31, 1977, abandoned. This application Oct. 30, 1979, Ser. No. 89,317**
**Int. Cl.³ B05D *3/12, 7/14***
**U.S. Cl. 427—247** **40 Claims**



1. A method of providing corrosion protection to a metal body having outer surface means and pore means communicating with said outer surface means, which comprises the steps of:

impregnating said pore means with inner protective material that is applied in liquid state, said inner material being substantially impervious to atmospheric corrosive agents,

removing from said outer surface means substantially all of said inner material that may remain thereon after said impregnating step while retaining impregnant inner material in said pore means, and

while said outer surface means remains substantially free of said inner material, applying an outer protective material to said metal body to form a covering of a solid outer protective material over said outer surface means and said pore means, said outer material being different from said inner material and being substantially impervious to atmospheric corrosive agents and to said inner material, said outer protective material being applied so as to form an intimate bond with said outer surface means and bridge over said pore means.

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**4,298,636**

## PROCESS FOR ACTIVATING PLASTIC SURFACES FOR METALLIZATION THEREOF BY TREATMENT WITH A COMPLEX FORMING SOLUTION

**Herbert Künzig, Aschaffenburg, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany**

**Continuation-in-part of Ser. No. 84,138, Oct. 12, 1979. This application Apr. 7, 1980, Ser. No. 137,826**
**Claims priority, application Fed. Rep. of Germany, Oct. 12, 1978, 2844425; Jul. 28, 1979, 2930784**
**Int. Cl.³ C23C *3/02***
**U.S. Cl. 427—304** **33 Claims**

1. A process for activating a plastic surface with noble metal nuclei for subsequent metallization, which comprises:

(a) roughening the plastic surface to be metallized, by mechanical, nonoxidative means;

(b) treating the mechanically, nonoxidatively roughened plastic surface with a complex-former solution to deposit a complex on the plastic surface;

(c) treating the resulting plastic surface with a solution of a noble metal complex salt so that the complex deposited by the complex-former solution is exchanged for a noble metal complex on the plastic surface; and

(d) converting the noble metal complex to metal nuclei.

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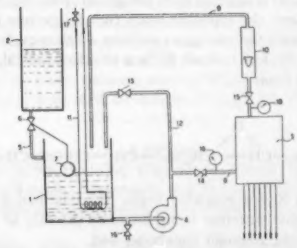
**4,298,637**

## METHOD OF APPLYING A BINDER HAVING LESS THAN 0.5% WATER SOLUBLE COMPOUNDS TO TUFTED FLOOR COVERINGS

**Jean-Claude Daniel, Fontenay-sous-Bois; Jacques Grossoleil, Paris, and Robert Roullet, Lyons, all of France, assignors to Rhone-Poulenc Industries, Paris, France**

**Division of Ser. No. 898,955, Apr. 21, 1978, Pat. No. 4,246,309. This application Aug. 15, 1980, Ser. No. 178,467**
**Claims priority, application France, Apr. 22, 1977, 77 12160**
**Int. Cl.³ B32B *27/06***
**U.S. Cl. 427—372.2** **1 Claim**



1. Process for the manufacture of tufted floor covering comprising impregnating a tufted sheet with an aqueous latex binder of a synthetic polymer in which the content in the latex of water soluble compounds dissolved in the aqueous phase is less than 0.5% by weight in relation to the polymer, sizing the impregnated sheet by compression, and then drying the impregnated sheet.

**4,298,638**

## COATING COMPOSITION OF A POLYAMIDE AND 2-NITRO-2-HYDROXYMETHYL-1,3-PROPANEDIOL

**Jerry H. Hunsucker, Terre Haute, Ind., assignor to International Minerals & Chemical Corp., Terre Haute, Ind.**

**Continuation-in-part of Ser. No. 25,642, Mar. 30, 1979, abandoned. This application Jul. 28, 1980, Ser. No. 172,627**

**Int. Cl.³ C08L *91/00***

**U.S. Cl. 427—385.5** **11 Claims**

1. A resinous composition comprising a polyamide prepared from a dimerized fatty acid and a polyamide and modified by 2-nitro-2-hydroxymethyl-1,3-propanediol.

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**4,298,639**

## WET STRENGTH POLYMERS

**Donald N. Van Eenam, Des Peres, Mo., assignor to Monsanto Company, St. Louis, Mo.**

**Division of Ser. No. 21,414, Mar. 19, 1979, Pat. No. 4,233,417. This application Apr. 7, 1980, Ser. No. 137,888**

**The portion of the term of this patent subsequent to Oct. 7, 1997, has been disclaimed.**

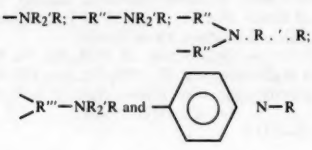
**Int. Cl.³ B05D *3/02, 3/04***

**U.S. Cl. 427—386** **9 Claims**

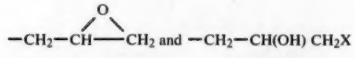
1. A process for improving the wet strength of a cellulosic substrate which comprises:

I. providing a composition comprising water-soluble, cationic, thermosetting polymer comprising a backbone formed of repeating segments, at least 10% of which comprise an amine group, wherein

A. substantially all the amine groups are pendant from the backbone segment and have a structure selected from the group consisting of



wherein $R^1$ is selected from the group consisting of methyl and, where the nitrogen bears two $R^1$ groups these, together with the nitrogen can form a heterocyclic radical; R'' is a divalent radical; R''' is a trivalent radical; and R is selected from



wherein X is a potential anion; the unattached bond in each amine structure being attached directly to a carbon atom of the polymer backbone; and

B. a 10% solids solution of the said polymer in water at 20° C. and a pH of 11 does not gel for at least 10 hours;

II. activating the composition by raising its pH to about 10 to 13;

III. applying an effective amount of the activated composition to the substrate; and

IV. curing the composition by the application of heat.

**4,298,640**

## MOLDINGS FOR AUTOMOBILES

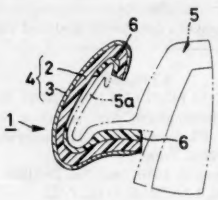
**Hisanori Katoh, Tokyo, Japan, assignor to Inoue Gomu Kogyo Kabushiki Kaisha, Aichi, Japan**

**Continuation-in-part of Ser. No. 944,307, Sep. 21, 1978, abandoned. This application Jan. 2, 1980, Ser. No. 109,067**

**Claims priority, application Japan, Mar. 31, 1978, 53-42502[U]**

**Int. Cl.³ B32B *7/02, 7/04;* B60R *13/04;* B61F *19/04***

**U.S. Cl. 428—31** **9 Claims**




1. A molding for automobiles, comprising a body consisting of a heat-resistant hardened synthetic resin base selected from the group consisting of ABS resin, acryl resin and polycarbonate resin having a hardness of 85–95 on the Rockwell R Scale, a stainless foil layer fixed to a first surface of said base, and an elastic layer, of a soft synthetic resin having a hardness of 50–95 on the Shore A Scale, formed on a second surface of said base at the contact area of said body with a car body, said second surface being on the opposite side of said base from said first surface wherein said soft synthetic resin is selected from the group consisting of soft vinyl chloride resin, vinyl acetate resin and ethylene-vinyl acetate copolymer resin.

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**4,298,641**

## HEAT RECOVERABLE ARTICLE

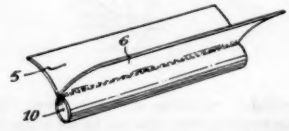
**Bodo Boettcher, Ottobrunn, Fed. Rep. of Germany, assignor to N.V. Raychem S.A., Kessel-lo, Belgium**

**Division of Ser. No. 680,478, Apr. 26, 1976, Pat. No. 4,118,260. This application Jul. 28, 1978, Ser. No. 929,170**

**Claims priority, application United Kingdom, Apr. 4, 1975, 17362/75**

**Int. Cl.³ F16L *11/00***

**U.S. Cl. 428—36** **4 Claims**




1. A heat recoverable article which comprises a heat recoverable sleeve that has been provided with at least two conduits, being respectively an auxiliary conduit being formed by bonding together at least two strips of bonding material on at least a portion of the surface of said sheet which in use forms the interior of said heat recoverable sleeve, and a main conduit formed by a holding means fastening together opposed edges of said sheet, said conduits being capable of receiving a substrate.

4,298,642

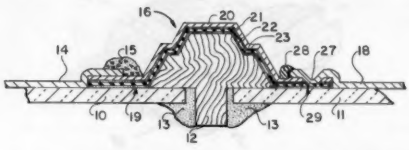
## SELF-ADHESIVE CROSSOVER FOIL OF METAL AND POLYESTER

John W. Walter, 511 Manhasset Woods Rd., Manhasset, N.Y. 11030

Continuation of Ser. No. 872,192, Jan. 25, 1978, abandoned. This application May 3, 1979, Ser. No. 35,579

Int. Cl.[3] B32B *15/08*

U.S. Cl. 428—40 8 Claims




1. In a security alarm system of the type which includes means for electrically interconnecting the ends of foils together on adjacent panes across a crossbar, the improvement comprising said means for electrically interconnecting comprising a self-adhesive crossover foil for attachment to the ends of said foils consisting of:

an electrically-conductive strip of metal selected from the group consisting of lead, copper, tin and aluminum having first and second surfaces on opposite sides thereof, the first surface of which is exposed to air;

an electrically-insulating strip of a material selected from the group consisting of polyethylene terephthalate, polyethylene, acetate and vinyl having first and second surfaces on opposite sides thereof, said first surface of which is joined to said second surface of said electrically-conductive strip, and said electrically-insulating strip being at least as wide as said electrically-conductive strip; and

a pressure-sensitive adhesive disposed on said second surface of said electrically-insulating strip.

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4,298,643

## FIBER SHEET FOR FORMING

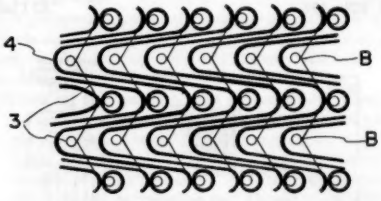
Yoshiaki Miyagawa, and Takeshi Mitomi, both of Otsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Japan

Filed Apr. 12, 1979, Ser. No. 29,173

Claims priority, application Japan, Apr. 14, 1978, 53/44384; Jun. 30, 1978, 53/80235; Aug. 22, 1978, 53/102621

Int. Cl.[3] D03D *27/00*

U.S. Cl. 428—85 11 Claims




1. A yarn interlaced fabric sheet, adapted for lamination to a plastic sheet to provide a laminate having a fabric surface having excellent appearance and hand, which fabric sheet comprises (A) a first side, adapted for lamination to a plastic sheet, comprised mainly of a stretchable, low softening point fiber having a softening point between 80° and 220° C. and an elongation at break of at least 50% and (B) a second appearance contributing side comprised mainly of a fiber having a softening point at least 20° C. higher than the softening point of the low softening point fiber.

11. A process which comprises heat forming an article from a laminate comprising:

(A) A yarn interlaced fabric sheet comprising:

(i) a first side comprised mainly of a stretchable, low softening point fiber having a softening point between 80° and 220° C. and an elongation at break if at least 50%, and

(ii) a second appearance contributing side comprised mainly of a fiber having a softening point at least 20° C. higher than the softening point of the low softening point fiber; and

(B) a formable plastic sheet, said fiber sheet (A) being bonded at said first side to said formable plastic sheet (B), said heat forming being conducted so that the stretchable, low softening point fiber stretches at the surface of the fabric sheet bonded to said plastic sheet along curved surfaces formed in the bonded surface of the plastic sheet during the heat forming process, while the fiber having an at least 20° C. higher melting point remains thermally stable at the appearance contributing side of the bonded fabric layer.

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4,298,644

## EXTREMELY FINE ACRYLIC POLYMER FIBER PILE FABRIC AND PROCESS FOR PRODUCING THE SAME

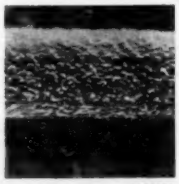
Kunitoshi Shimizu; Masakazu Takamura, both of Fuji, and Toshio Iwasa, Kawasaki, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 925,247, Jul. 17, 1978, abandoned. This application Mar. 6, 1980, Ser. No. 127,606

Claims priority, application Japan, Jul. 25, 1977, 52-88330; Aug. 23, 1977, 52-100133; Aug. 23, 1977, 52-100134; Aug. 23, 1977, 52-100135

Int. Cl.[3] B32B *33/00;* D06C *11/00*

U.S. Cl. 428—91 37 Claims



1. An extremely fine acrylic polymer fiber pile fabric comprising a substratum fabric impregnated with an elastic polymer and having at least one pile layer formed by raising at least one surface of said fabric, characterized in that said piles consist essentially of extremely fine independent acrylic polymer fibers, each of which has a denier of 0.8 or less and is provided with a number of amorphous scale-shaped protuberances formed on the peripheral surface thereof, and which has been produced by a wet spinning method from an acrylic polymer containing at least 80% by weight of acrylonitrile.

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4,298,645

## TARPAULINS HAVING GREAT TEARING STRENGTH

Tsutomu Obayashi, Kanamachi, and Hideyuki Hiraoka, Musashino, both of Japan, assignors to Hiraoka & Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 21,921, Mar. 19, 1979, abandoned. This application Jul. 14, 1980, Ser. No. 168,057

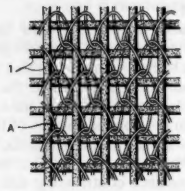
Claims priority, application Japan, Apr. 18, 1978, 53-41384; Apr. 20, 1978, 53-45960; Nov. 16, 1978, 53-141454

Int. Cl.[3] B32B *5/12*

U.S. Cl. 428—110 7 Claims

1. A tarpaulin having a great tear strength, comprising (A) a base fabric composed of (a) a warp layer consisting of a number of warp threads arranged parallel to each other; (b) a weft

layer which consists of a number of weft threads arranged parallel to each other, said weft layer being superimposed on said warp layer in such a manner that the longitudinal direction of said weft threads crosses the longitudinal direction of said warp threads, and; (c) a number of auxiliary threads which are entangled around said warp threads and said weft threads and which combine said warp threads with said weft threads at the




crossing points thereof, and; (B) at least one waterproofing layer formed on at least one surface of said base fabric, the breaking strength, the breaking elongation and/or the breaking work of said auxiliary threads being higher than that of said warp and weft threads, and/or the adhesive strength of said auxiliary threads to said waterproofing layer being lower than that of said warp and weft threads.

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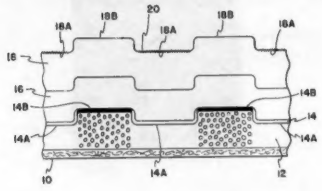
**4,298,646**

## DIFFERENTIAL GLOSS PRODUCTS AND METHODS OF MAKING THE SAME

**Laurence F. Haemer, Newtown, Pa., and Theodore Kimak, Clifton, N.J., assignors to Congoleum Corporation, Kearny, N.J.**

**Filed Jun. 30, 1980, Ser. No. 164,456**
**Int. Cl.³ B32B** *3/30;* **B05D** *3/02*
**U.S. Cl. 428—159** **16 Claims**



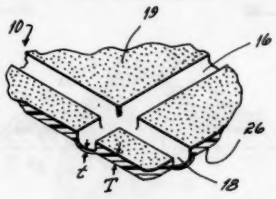

1. A differential gloss resinous sheet material comprising:
a base resinous material, portions of which are blown or foamed and portions of which are unblown or unfoamed;
a printing ink composition on said base resinous material in the form of a predetermined pattern or design, some printed portions of which contain a urethane polymerization catalyst and some printed portions of which contain a blowing or foaming inhibitor, said urethane polymerization catalyst-containing portions and said blowing or foaming inhibitor-containing portions occupying the same or different portions;
a resinous wear layer applied to said printing ink composition and having relatively higher areas and relatively lower areas;
a substantially monomer-free polyurethane top coating, substantially all parts of which are substantially completely polymerized, applied to said resinous wear layer and having relatively higher surfaces and relatively lower surfaces, some of said surfaces having a smooth, shiny, high gloss appearance and some of said surfaces having a dead, dull, low gloss appearance; and
a particulate, powdered or granulated material adheringly embedded in said surfaces having a dead, dull, low gloss appearance.

**4,298,647**

## CROSS-TEARABLE DECORATIVE SHEET MATERIAL

**Leopoldo V. Cancio, and Pai-Chuan Wu, both of Cincinnati, Ohio, assignors to Clopay Corporation, Cincinnati, Ohio**

**Filed Jul. 16, 1979, Ser. No. 57,792**
**Int. Cl.³ B32B** *3/30, 27/20*
**U.S. Cl. 428—167** **17 Claims**




1. A surface covering comprising a length of embossed polymeric film having a first series of spaced, substantially parallel continuous imperforate hand-tear lines of reduced film thickness extending in a first direction and a second series of spaced, substantially parallel continuous imperforate hand-tear lines of reduced film thickness extending in a second direction and intersecting said first series of hand-tear lines, said film being formed of a polymeric matrix containing a dispersed second phase in an amount effective to initiate and propagate tear along said hand-tear lines such that said surface covering may be sized in two directions by hand with generally the same degree of tearing force wihtout use of cutting tools to provide smooth, straight edges after sizing.

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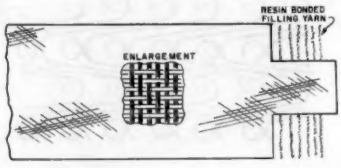
**4,298,648**

## BELTING FABRIC

**John Turnbull, Charlotte, N.C., assignor to Celanese Corporation, New York, N.Y.**

**Filed Feb. 28, 1979, Ser. No. 15,974**
**Int. Cl.³ B32B** *3/00*
**U.S. Cl. 428—195** **32 Claims**

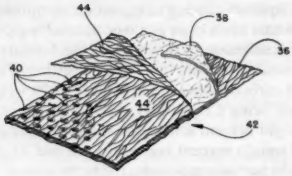



1. A woven seat belting fabric approximately two inches broad which comprises resin bonded polyester multifilament filling yarns, and polyester multifilament warp yarns; said fabric having a lateral stiffness, as measured by the lateral belt stiffness test of at least 0.650 with a 20 gram load, and at least 0.300 with a 50 gram load; said fabric deflecting from the horizontal at least 0.875 inches with a central load of 110 grams when tested by the warp stiffness test; said fabric having a breaking load greater than 6,300 pounds for a fabric having a weight of less than 12 pounds per 100 yards.

## 4,298,649
## NONWOVEN DISPOSABLE WIPER

Gary H. Meitner, Winneconne, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jan. 7, 1980, Ser. No. 110,095
Int. Cl.[3] B32B 5/12
U.S. Cl. 428—198 8 Claims




1. A nonwoven composite wiper consisting essentially of,

(a) a web having a basis weight in the range of from about 1.0 oz/yd$^2$ to 4.0 oz/yd$^2$ of meltblown, thermoplastic polypropylene microfibers having an average diameter in the range of up to about ten microns and

(b) on at least one side of said microfiber web a split thermoplastic foamed polypropylene filamentary web having a basis weight in the range of from about 0.1 oz/yd$^2$ to 0.6 oz/yd$^2$ comprising filaments having an average diameter at least about twice that of said microfibers up to a maximum of about 40 microns,

said composite being pattern bonded and containing 0.1 to 1.0% by weight of a surfactant selected from the group consisting of ionic and nonionic surfactants.

## 4,298,650
## PHOSPHORESCENT SCREENS

Chen-i Lu, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 31, 1980, Ser. No. 136,144
Int. Cl.[3] B32B 3/26, 5/16
U.S. Cl. 428—306 39 Claims

1. A phosphorescent screen comprising a support and a layer of finely-divided particles of a phosphor dispersed in a cross-linked, void-containing polymeric matrix, said layer having been formed by:

(1) coating said support with a heat-curable composition comprising a suspension of said finely-divided phosphor particles in a viscous liquid composition, said viscous liquid composition comprising a first component that is capable of being heat-cured to form a cross-linked polymeric matrix surrounding said phosphor particles and a second component that is capable of being evaporated to generate voids within said matrix, said first component comprising:

(a) an unsturated crosslinkable polymer,

(b) a polymerizable acrylic monomer,

(c) a thermoplastic polyurethane elastomer, and

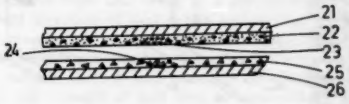
(d) a heat-activatable polymerization initiator, and

(2) heating said coating for a time and at a temperature sufficient to cure said first component, to thereby form a cross-linked polymeric matrix surrounding said phosphor particles, and to evaporate said second component, to thereby generate voids within said matrix.

## 4,298,651
## IMAGE WISE DEVELOPABLE SHEET

Geoffrey C. Tutty, Christchurch, New Zealand, assignor to INCA Limited, Christchurch, New Zealand

Division of Ser. No. 79,258, Sep. 27, 1979, which is a continuation-in-part of Ser. No. 930,013, Aug. 1, 1978, abandoned. This application Jul. 9, 1980, Ser. No. 167,434
Claims priority, application New Zealand, Aug. 2, 1977, 184,811; Feb. 8, 1978, 186,415
Int. Cl.[3] B41M 5/16, 5/18, 5/20, 5/22
U.S. Cl. 428—307 18 Claims




1. A sheet or film of any configuration which includes a substantially dry coating of a color developable composition comprising a free base of a cationic solvent dye in $OH^-$ form, said dye being capable of developing a color or a more intense color upon reaction with an organic acid developing agent and a binder selected from the group consisting of waxes and resins which (1) are non-polar and non-acid, (2) do not develop said free base and (3) are soluble in ASTM Class 1 solvents, said binder having been mixed with said free base in the presence of a solvent for both said free base and binder, which solvent (1) does not develop said free base, (2) is weakly hydrogen bonded and (3) is classified as a Class 1 (ASTM) solvent.

## 4,298,652
## METHOD OF PRODUCING MEDIUM-GRADE COATED PAPER FOR ROTOGRAVURE PRINTING

Kuzuhiko Suzuki, Nishinomiya; Yasuhiro Fujiki, Ibaraki; Tojiro Kitahori, Kawanishi, and Akira Takada, Kobe, all of Japan, assignors to Kanzaki Paper Mfg. Co., Ltd., Tokyo, Japan

Filed May 8, 1980, Ser. No. 147,825
Claims priority, application Japan, May 11, 1979, 54-58327
Int. Cl.[3] B32B 23/08, 27/10; D21H 1/28
U.S. Cl. 428—323 13 Claims

10. Coated paper for rotogravure printing which comprises a paper base having a fiber content comprising 10 to 100 parts by weight of high-yield pulp(s), said high-yield pulp(s) having a 42-mesh fiber fraction content below 30% by weight, said paper base being coated on either or both surfaces with coating composition (A) or (B),

said coating composition (A) comprising pigments containing natural ground calcium carbonate with a specific surface area of 1.5 to 2.5 m$^2$/g in a proportion of 5 to (90S-137.5)% by weight of the total pigment content thereof, where "S" represents the specific surface area (m$^2$/g) of natural ground calcium carbonate and principal adhesive of either alkali-sensitive synthetic resin emulsion or a mixture of viscosity increasing agent(s) and alkali-nonsensitive synthetic resin emulsion,

said coating composition (B) comprising pigments containing natural ground calcium carbonate with a specific surface area of 2.5 to 5.0 m$^2$/g in a proportion of 5 to 100% by weight of the total pigment content, and principal adhesive of either alkali-sensitive resin emulsion or a mixture of viscosity increasing agent(s) and alkali-nonsensitive synthetic resin emulsion.

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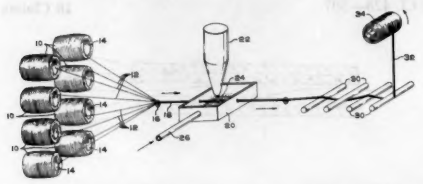
## METHOD FOR PRODUCING AN IMPROVED BUNDLE OF A PLURALITY OF FIBER GLASS STRANDS

John Maaghul, Monroeville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 969,898, Dec. 15, 1978, abandoned.
This application Jan. 23, 1980, Ser. No. 114,532
Int. Cl.[3] D02G *3/00*
U.S. Cl. 428—378 12 Claims



1. A method of providing a small degree of integrity to a plurality of glass fiber strands, wherein each strand is composed of a plurality of glass fibers coated with a sizing composition to protect the fibers from interfiber abrasion, and to provide integrity between the fibers making up the strands, so that the individual glass fiber strands are slightly held together but have reduced coalescence after further processing operations, thereby eliminating the need for a working operation to separate the strands from the plurality of strands, comprising:

(a) removing a plurality of strands of glass fibers from their individual forming packages on which they are collected during forming of the glass fiber strands from molten glass streams flowing from small openings in a bushing;

(b) contacting the plurality of glass fiber strands with solid, fine, particulized, thermoplastic material in a forced gas chamber;

(c) gathering together the plurality of glass fiber strands into a bundle while the glass fiber strands are contacting the thermoplastic material, whereby the contacting and gathering allow the glass fiber strands to have thermoplastic material on one or more of the strands in an amount up to about 0.5 percent by weight of the dried combined strands, wherein the pickup is the result of electrostatic charges on the plurality of glass fiber strands resulting from the removal of the strands from the forming packages;

(d) heating the bundle of the plurality of glass fiber strands containing the thermoplastic material to effect softening of the thermoplastic material to provide a temporary bond between the strands so that a bundle of glass fiber strands is produced wherein the strands are slightly held together.

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## POWDERED ELASTOMERS AND PROCESS THEREFOR

John C. McCarty, Elyria, and Terrence E. Wagner, Avon Lake, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Apr. 28, 1980, Ser. No. 144,100
Int. Cl.[3] B32B *5/16*
U.S. Cl. 428—407 15 Claims

1. A free-flowing product in the form of powder particles coagulated with a trivalent metal salt coagulant comprising a synthetic elastomeric material having dispersed therein an insolubilized cellulose ether gel and having an adhering layer of a coating resin thereon.

7. Process for preparing a free-flowing product in the form of powder particles comprising adding synthetic elastomeric latex and an alkali metal salt of a water-soluble cellulose ether to a trivalent metal salt coagulating solution, stirring the coagulating solution and the additives therein, adding to the coagulating solution a coating latex, stirring the coagulating solution and the additives therein, and recovering the product in free-flowing powder form.

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## AQUEOUS SILICONE RESIN COATING COMPOSITION AND SOLID SUBSTRATE COATED THEREWITH

William D. Kray, Burnt Hills, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Jul. 28, 1980, Ser. No. 172,954
Int. Cl.[3] B32B *27/36*
U.S. Cl. 428—412 18 Claims

1. In an aqueous coating composition comprising a dispersion of colloidal silica in an aliphatic alcohol-water solution of the partial condensate of a silanol of the formula $RSi(OH)_3$, wherein R is selected from the group consisting of alkyl having from 1 to 3 carbon atoms and aryl, at least 70 weight percent of the silanol being $CH_3Si(OH)_3$, said composition containing 10 to 50 weight percent solids, said solids consisting essentially of 10 to 70 weight percent colloidal silica and 30 to 90 weight percent of the partial condensate, the improvement comprising the intimate admixture of a small stabilizing of a $\beta$-dicarbonyl compound with said composition.

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## EPOXY-ELASTOMER LOW TEMPERATURE CURABLE, SOLVENTLESS, SPRAYABLE, STATOR WINDING ADHESIVE-BRACING COMPOSITIONS

Morris A. Mendelsohn, Wilkins Township, Allegheny County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 28, 1980, Ser. No. 134,730
Int. Cl.[3] C08L *63/02*
U.S. Cl. 428—414 14 Claims

1. A sprayable, solventless, crack resistant, flexible adhesive-bracing composition, useful for coating stator end windings, comprising the admixture of:

(1) 100 parts by weight of diglycidyl ether of bisphenol A epoxy resin having an epoxy equivalent weight of between about 160 and about 260;

(2) 0 to about 8 parts by weight of a coloring pigment;

(3) about 0.5 to about 4.0 parts by weight of a thixotropic agent;

(4) about 100 to about 200 parts by weight of a secondary amine terminated butadiene/acrylonitrile reactive liquid polymer having a 2-butenylene:cyanoethylene chain segment ratio of between about 3:1 and about 7:1, and a viscosity at 27° C. of between 150,000 cps. and 200,000 cps., and

(5) about 20 to about 40 parts by weight of an amine terminated curing agent not containing cyanoethylene chain segments, to provide a solventless composition.

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## CORROSION PROTECTION FOR METAL SURFACES

Michael T. Orillion, Baton Rouge, La., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 10, 1980, Ser. No. 128,767
Int. Cl.[3] B32B *9/00, 15/04, 15/08*
U.S. Cl. 428—416 9 Claims

1. A protective cover for metal surfaces, comprising: a thermal insulation covering the metal surface to reduce the flow of heat between the metal surface and its surroundings; and a composition useful for the corrosion-protection of the metal surface, said composition disposed between the metal surface and the outer surface of the insulation and including a borate salt of an alkali metal, a nitrite salt of an alkali metal, and a molybdate salt of an alkali metal.

4,298,658

## VAPOR PERMEATION CURABLE COATINGS BASED ON ALKYD RESINS

Chacko Thankachan, Willowdale; John G. Ritchie, Mississauga; Eugene Sahayada, Toronto, and Asok Sengupta, Downsview, all of Canada, assignors to J.G.L. Chemicals Ltd., Toronto, Canada

Continuation-in-part of Ser. No. 76,680, Sep. 19, 1979, Pat. No. 4,267,239. This application May 1, 1980, Ser. No. 145,704

Int. Cl.[3] C08L *91/00;* B05D *3/02;* B32B *27/40*

U.S. Cl. 428—425.1 24 Claims

18. An article comprising a substrate coated with a cured urethane coating derived from a urethane forming composition comprising:

(i) an alkyd resin modified with 2,6-dimethylol-p-cresol to provide side chain aromatic hydroxyl groups on the alkyd resin backbone, and

(ii) at least one organic isocyanate selected from the group consisting of di- and polyisocyanates, said at least one isocyanate having an at least partial aromatic character, wherein

(iii) components (i) and (ii) are present in amounts such that the ratio of active hydroxyl hydrogen groups in (i) to isocyanate groups in (ii) is 1:1 to 1.5.

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4,298,659

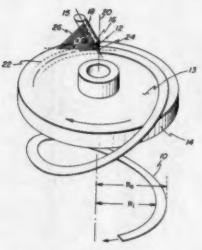
## HELICAL METALLIC RIBBON FOR CONTINUOUS EDGE WINDING APPLICATIONS

Howard H. Liebermann, Schenectady; Peter G. Frischmann, Scotia, both of N.Y., and George M. Rosenberry, Jr., Hendersonville, Tenn., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 22, 1978, Ser. No. 972,239

Int. Cl.[3] B21C *37/00;* B21F *3/00*

U.S. Cl. 428—592 11 Claims



1. A continuous length of cast edge-wound metallic ribbon having a helical shape, a pair of substantially parallel opposed major surfaces, an inner peripheral edge and an outer peripheral edge.

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4,298,660

## STEEL FIBER FOR REINFORCED CONCRETE

Takeo Nakagawa, Kawasaki, Japan, assignor to Keinosuke Aida, Sagamihara, Japan

Division of Ser. No. 800,031, May 24, 1977, abandoned. This application Dec. 7, 1978, Ser. No. 967,389

Claims priority, application Japan, May 24, 1976, 51-59190

Int. Cl.[3] B32B *15/02*

U.S. Cl. 428—599 6 Claims

1. A reinforcing material for mixing into concrete to input high strength thereto, produced by directly cutting a surface of a steel block using a milling cutter, said material comprising a steel fiber cut from said block in a direction transverse to movement direction of said cutter and having a triangular lateral cross-section and undulations on one surface thereof, said fiber including a twist in the length thereof and shearing deformations therein wherein the strength of said fiber is increased by a plastic deformation therein, the cross-sectional area being 0.1 to 0.4 $mm^2$ and the length being 20 to 50 mm.

5. A reinforcing material for mixing into concrete to input high strength thereto, produced by directly cutting a surface of a steel block using a milling cutter, said material comprising a steel fiber cut from said block in a direction transverse to movement direction of said cutter and having a triangular lateral cross-section and undulations on one surface thereof, said fiber including a plurality of concave and convex portions of the surface thereof, and shearing deformations therein wherein the strength of said fiber is increased by a plastic deformation therein, the cross-sectional area being 0.1 to 0.4 $mm^2$ and the length being 20 to 50 mm.

6. A reinforcing material for mixing into concrete to input high strength thereto, produced by directly cutting a surface of a steel block using a milling cutter, said material comprising a steel fiber cut from said block in a direction transverse to movement direction of said cutter and having a triangular lateral cross-section and undulations on one surface thereof, said fiber including step portions at the end thereof and shearing deformations therein wherein the strength of said fiber is increased by a plastic deformation therein, the cross-sectional area being 0.1 to 0.4 $mm^2$ and the length being 20 to 50 mm.

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4,298,661

## SURFACE TREATED STEEL MATERIALS

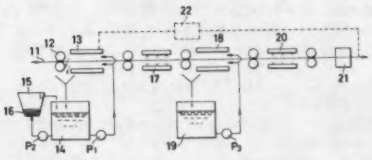
Teruo Ikeno, Mitaka; Satoshi Kado, Fujisawa; Saburo Ayusawa, Funabashi; Hironobu Kawasaki, Machida, and Takashi Watanabe, Ayase, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Jun. 1, 1979, Ser. No. 44,485

Claims priority, application Japan, Jun. 5, 1978, 53-67465; Jun. 5, 1978, 53-67466; Jun. 30, 1978, 53-79357; Jul. 20, 1978, 53-88640; Nov. 22, 1978, 53-144439; Nov. 22, 1978, 53-144440

Int. Cl.[3] B32B *15/04, 15/18*

U.S. Cl. 428—623 9 Claims



1. A surface treated steel material comprising a manganese coating on the steel material and a film consisting essentially of MnOOH (manganic hydroxide) on the manganese coating.

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4,298,662

## RESEALABLE VENT VALVE FOR CONTAINERS SUCH AS BATTERIES

Raymond K. Sugalski; John W. Hooke, both of Gainesville, and Paul E. Pate, Branford, all of Fla., assignors to General Electric Company, Gainesville, Fla.

Filed Jul. 31, 1980, Ser. No. 174,147

Int. Cl.[3] H01M *10/44*

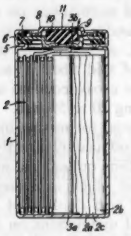
U.S. Cl. 429—50 11 Claims

1. A resealable pressure relief valve capable of relieving the excessive build-up of internal pressure within the closed container of an energy cell by venting gas from within the container to the atmosphere and resealing the container after venting, said valve comprising:

an outer cover plate,

an inner base plate joined to the outer cover plate, a central cavity being formed therebetween; and

a compressed, resilient elastomeric member interposed in the cavity between said plates whereby said elastomeric member is positioned to overlie a vent orifice located in the inner base plate, said elastomeric member being compressed to a degree whereby the elastomeric member forms an air-tight seal over the vent orifice when the internal container pressure is less than a predetermined limit, the shape of the elastomeric member being such that greater compression thereof occurs in the central portion



directly above the vent orifice and lesser degree of compression occurs in the peripheral portion of the member; whereby said elastomeric member is capable of becoming deformed or distorted with respect to the inner base plate and breaking its seal over the vent orifice when the internal container pressure exceeds a predetermined limit for the container, said break in the seal over the vent orifice in the inner plate forming a passageway for gases to exit from the interior of the container to the atmosphere, and whereby the elastomeric member has sufficient memory to reseal the vent orifice, when the internal pressure of the container falls below the predetermined limit.

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**4,298,663**

**PREDISCHARGED NONAQUEOUS CELL**

**Peter R. Moses, Windham, N.H., assignor to Duracell International Inc., Bethel, Conn.**

**Continuation-in-part of Ser. No. 80,891, Oct. 1, 1979, Pat. No. 4,264,689. This application Nov. 5, 1979, Ser. No. 91,149**

**The portion of the term of this patent subsequent to Apr. 28, 1998, has been disclaimed.**

**Int. Cl.³ H01M *6/16***

**U.S. Cl. 429—50** **24 Claims**

1. A method of stabilizing an electrochemical cell having an active metal anode, a solid active cathode and a nonaqueous electrolyte, said method comprising the step of placing a cathode discharging additive within said cell, said additive being at least partially soluble in said electrolyte and in sufficient quantity to self discharge substantially all of the surface of said active cathode prior to initial discharge of said cell, wherein reaction products of said self discharge are substantially nonreactive within said cell and wherein said additive is placed within said cell by dissolving said additive in said nonaqueous electrolyte.

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**4,298,664**

**PHOSPHORUS-CONTAINING SOLID STATE ELECTROLYTE**

**Ashok V. Joshi, Fishkill; Arun D. Jatkar, Goshen, both of N.Y., and William P. Sholette, Warminster, Pa., assignors to Ray-O-Vac Corporation, Madison, Wis.**

**Filed Oct. 24, 1980, Ser. No. 200,277**

**Int. Cl.³ H01M *6/18***

**U.S. Cl. 429—191** **11 Claims**

1. A solid state electrolyte comprising an interdiffused mixture of, in mole percent, about 0.4% to about 16% of a material selected from the group of boron triiodide and phosphorus triiodide, about 33% to about 99% lithium iodide and up to about 60% alumina.

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**4,298,665**

**CATHODE COMPRISING THE REACTION PRODUCT OF $BI_2O_3$ AND $WO_3$**

**William P. Evans, Rocky River, and Violeta Z. Leger, North Olmsted, both of Ohio, assignors to Union Carbide Corporation, New York, N.Y.**

**Filed Jun. 27, 1980, Ser. No. 163,630**

**Int. Cl.³ H01M *4/48, 6/16***

**U.S. Cl. 429—197** **6 Claims**

1. A nonaqueous cell comprising an active metal anode, an organic electrolyte solution and a solid cathode material comprising the reaction product of bismuth trioxide and tungsten trioxide.

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**4,298,666**

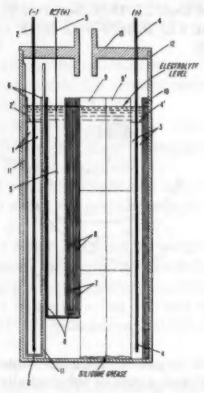
**COATED OPEN-CELLED MICROPOROUS MEMBRANES**

**Henry T. Taskier, Fanwood, N.J., assignor to Celanese Corporation, New York, N.Y.**

**Filed Feb. 27, 1980, Ser. No. 125,195**

**Int. Cl.³ H01M *2/14***

**U.S. Cl. 429—206** **19 Claims**



1. At least one open-celled microporous membrane having deposited on at least one surface thereof a uniform porous coating comprising a low hydrogen over-potential material, said microporous membrane prior to deposition of said coating being characterized by an electrical resistance when rendered hydrophilic of not greater than about 15 milliohms-in$^2$, a reduced bulk density as compared to the corresponding substrate membrane having no open-celled structure, a surface area of at least 10 square meters per gram, and an average pore size of from about 200 to about 10,000 angstroms, said porous coating covering an area which is substantially coextensive with the surface of the microporous substrate membrane on which it is deposited and being characterized by a uniform total thickness of at least 50 angstroms, yet insufficient to cause the electrical resistance of said coat of microporous membrane to exceed about 75 milliohms-in$^2$, when rendered hydrophilic, said coated microporous membrane having the ability to pass greater than about 0.01 mililiters of water per minute per square centimeter at a water pressure of 100 pounds per square inch gauge.

4,298,667

## ELECTRODE COATING COMPOSED OF COPOLYMERS DERIVED FROM DIACETONE ACRYLAMIDE

Guy Rampel, Gainesville, Fla., assignor to General Electric Company, Gainesville, Fla.

Division of Ser. No. 966,745, Dec. 5, 1978, Pat. No. 4,245,016. This application Jun. 9, 1980, Ser. No. 157,313
Int. Cl.³ H01M 2/16
U.S. Cl. 429—248 4 Claims

1. In a battery separator for use in zinc battery cells, the improvement comprising a separator coating consisting essentially of a copolymer derived from diacetone acrylamide and a polymerizable monomer selected from acrylic acid or methacrylic acid.

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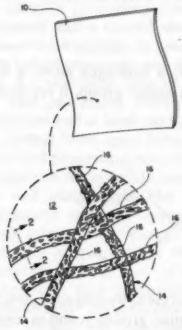
4,298,668

## ALKALINE BATTERY, ELECTROLYTE ABSORBER THEREFOR

George F. Schmidt, Neenah, and Robert E. Weber, Appleton, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Jul. 3, 1980, Ser. No. 165,656
Int. Cl.³ H01M 2/14
U.S. Cl. 429—250 11 Claims



1. An improved electrolyte absorber for use in an alkaline battery cell for physically separating electrodes of said cell and for holding alkaline electrolyte in contact with an electrode during chemical reactions of said cell, in which said absorber comprises a flexible and fibrous polyolefin substrate made up of a plurality of physically entangled microfibers, resistant to strong alkali and oxidation with said substrate being permeable to electrolyte ion transfer, said improvement comprising:

a wetting composition deposited over and adhered to external surfaces of said microfibers, said composition comprising a substantially homogeneous admixture of:

1. a polymeric binder;
2. inert hydrophilic filler particles; and
3. a phosphate ester wetting agent;

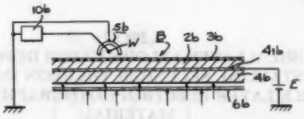
the polymeric binder in said composition substantially covering the external surfaces of said microfibers with portions of said filler particles being exposed and protruding through said binder in random distribution, said wetting agent being of the type which when immersed in and in contact with said alkaline electrolyte reacts with said electrolyte to lower the surface tension thereof, said lowered surface tension permitting said reacted electrolyte to rapidly wet said exposed filler particles, the wetting of said filler particles being substantially permanent while immersed in said electrolyte.

4,298,669

## ELECTROPHOTOGRAPHIC PROCESS AND APPARATUS

Giichi Marushima; Hiroshi Tanaka; Umi Tosaka, all of Tokyo; Shinkichi Takahashi, Yokohama, and Takao Komiyu, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 298,010, Oct. 16, 1972, abandoned, which is a division of Ser. No. 133,788, Apr. 14, 1971, Pat. No. 3,734,609, which is a division of Ser. No. 563,899, Jul. 8, 1966, Pat. No. 4,071,361. This application Aug. 3, 1979, Ser. No. 63,431
Claims priority, application Japan, Feb. 23, 1966, 41-10915
Int. Cl.³ G03G 13/24, 13/04
U.S. Cl. 430—55 3 Claims



1. A process for forming an electrostatic image of an original on a photosensitive plate having a conductive base, a photoconductive layer overlying said base and exhibiting p-type or n-type semi-conductivity and an insulative layer overlying said photoconducting layer, said conductive base being transparent to activating light for said photoconductive layer and said insulative layer being opaque to said activating light, said photosensitive plate being characterized in having carrier charge of a polarity corresponding to the conductivity type of said photoconductive layer injectable from said conductive base into said photoconductive layer and bound in the region of the interface between said insulative and photoconductive layers, said process comprising the steps of:

(a) applying a first charge of a polarity opposite to the conductivity type of said photoconductive layer substantially uniformly onto said insulative layer by moving a primary corona discharging means over said insulative layer to inject and bind carrier charge in the region of the interface between said insulative and photoconductive layers;

(b) then exposing said photoconductive layer to a pattern of activating image light by scanning an optical system over the original and projecting original image light through said conductive base while applying a corona discharge onto said insulative layer which results in the application of charge of a polarity opposite to that of the initial charge by moving a secondary corona discharging means over said insulative layer, said optical system and said secondary corona discharging means being aligned with respect to the photosensitive plate so as to facilitate their simultaneous operation; and then

(c) exposing said photoconductive layer to activating light by projecting activating light generated from an overall exposure means through said transparent conductive base to discharge bound carrier charge remaining in the region of said interface and form a high contrast electrostatic image.

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4,298,670

## PHOTOSENSITIVE ELEMENT FOR ELECTROPHOTOGRAPHY

Keiichi Murai, Tokyo, and Takehiko Matsuo, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 838,376, Sep. 30, 1977, Pat. No. 4,183,748, which is a continuation of Ser. No. 381,403, Jul. 23, 1973, abandoned. This application Apr. 11, 1979, Ser. No. 29,111
Claims priority, application Japan, Jul. 29, 1972, 47-76145
Int. Cl.³ G03G 5/08, 5/087
U.S. Cl. 430—67 9 Claims

1. A photoconductive element including a photoconductive

layer which comprise photoconductive particles dispersed in a resin binder, said photoconductive particles being formed from inorganic photoconductive particulate material subject to deterioration of its photoconductive properties due to temperature and humidity variations in the presence of surface ionic impurities, said particles being formed by washing said photoconductive material in an aqueous solution containing at least one type of ion exchange resin to solubilize any ionic impurities from the surface of said particulate material and then separating said particulate material from said solution, said photoconductive element being stable against deterioration of its photoconductive properties due to temperature and humidity.

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**4,298,671**

## TELLURIUM LAYER ALLOWS VAPOR DEPOSITION OF CRYSTALLINE SELENIUM THEREON IN MAKING DOUBLE LAYER ELECTROPHOTOGRAPHIC RECORD MATERIAL

**Karl-Heinz Kassel; Manfred Lutz, both of Warstein; Josef Stuke, Marburg, and Hubert Walsdorfer, Warstein, all of Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltung-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany**

**Filed Feb. 16, 1979, Ser. No. 12,858**

**Claims priority, application Fed. Rep. of Germany, Mar. 1, 1978, 2808757**

**Int. Cl.³ G03G** *5/05*

**U.S. Cl. 430—128** **6 Claims**

1. In a process for producing an electrophotographic recording material composed of a double layer of amorphous and crystallized selenium on an electrically conductive substrate, the improvement comprising applying a layer of tellurium having a thickness of 10 to 500 nm onto the surface of the substrate, and then vapor-depositing selenium at a rate of about 1 μ/min onto said tellurium layer to a thickness of 20 to 100μ while said substrate is at a temperature of 62°–75° C., to form a double layer comprising a crystallized selenium layer overlying the tellurium layer and an amorphous selenium layer overlying the crystallized selenium layer.

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**4,298,672**

## TONERS CONTAINING ALKYL PYRIDINIUM COMPOUNDS AND THEIR HYDRATES

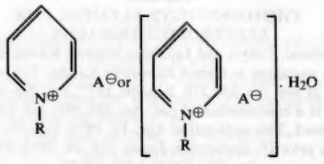
**Chin H. Lu, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.**

**Filed Jun. 1, 1978, Ser. No. 911,623**

**Int. Cl.³ G03G** *9/08*

**U.S. Cl. 430—108** **12 Claims**

1. A positively charged dry particulate electrostatic toner composition in combination with a particulate carrier, said toner consisting essentially of a resin component, a pigment component and from about 0.1 to 10 percent based on the weight of toner of an alkyl pyridinium compound or its hydrate of the formula:




wherein R is a hydrocarbon radical containing from about 15 to about 18 carbon atoms, and A is chloride or bromide.

**4,298,673**

## LITHOGRAPHIC TYPE DIFFUSION TRANSFER DEVELOPING COMPOSITION

**Kikuo Kubotera; Eiichi Mizuki; Masato Satomura, all of Asaka; Haruhiko Iwano, and Tadahiro Fujiwara, both of Minami-ashigara, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan**

**Continuation of Ser. No. 339,455, Mar. 8, 1973, abandoned. This application Mar. 6, 1978, Ser. No. 884,672**

**Claims priority, application Japan, Mar. 10, 1972, 47/24533**

**Int. Cl.³ G03C** *5/54*

**U.S. Cl. 430—204** **13 Claims**

1. A process for producing a high contrast image having a sharp toe-gradation which comprises exposing a silver halide light-sensitive material and developing using a diffusion transfer development process for developing the silver halide light-sensitive material and producing an image in an image receiving layer containing diffusion transfer nuclei, the improvement comprising using, as a lithographic type diffusion transfer developer, a developer prepared from a developer composition containing

(1) a developing agent comprising:

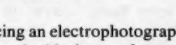
(A) one or more 3-pyrazolidones and/or one or more aminophenols and

(B) one or more polyhydroxybenzenes;

(2) an alkali;

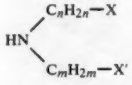
(3) a silver halide dissolving agent; and

(4) at least one of the amines represented by the following general formulae (I), (II) and (III):



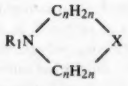
(I)

wherein X represents a hydrogen atom, a hydroxy group, a carboxy group or an amino group, n represents an integer of 1–12,



(II)

wherein X and X' represent hydrogen atoms, hydroxy groups, carboxy groups or amino groups, n and m represent integers of 1–12,



(III)

wherein X represents an oxygen atom, —$CH_2$— or —$NR_2$—, $R_1$ and $R_2$ each represents a hydrogen atom, an alkyl group or substituted alkyl group each having 1–12 carbon atoms or an acyl group of the formula $R_3CO$- wherein $R_3$ represents a hydrogen atom or an alkyl group, a substituted alkyl group or an alkenyl group each having 1–12 carbon atoms, and n represents an integer of 2 or 3, and where the recited components of the developer composition are present in the developer composition in proportions such that, in 1 liter of developer prepared from said developer composition, the recited components are present in the following amounts:

(1) developing agent comprising components (A) and (B): about 1.01 g to about 70 g;

(2) alkali: about 1 g to about 200 g;

(3) silver halide dissolving agent: about 1 g to about 100 g; and

(4) amine: 0.5 to 250 g.

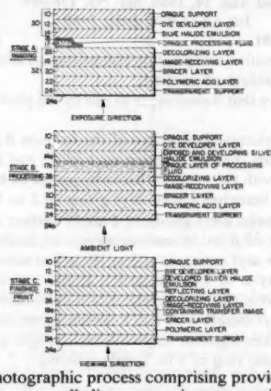
## 4,298,674
## COLOR TRANSFER FILM AND PROCESS

**Edwin H. Land, Cambridge; Leon D. Cerankowski, Carlisle, and Neil Mattucci, Billerica, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.**

**Continuation-in-part of Ser. No. 33,001, Apr. 24, 1979, abandoned. This application Apr. 24, 1980, Ser. No. 143,293**

**Int. Cl.³ G03C** *5/54*

**U.S. Cl. 430—213** **69 Claims**




**1**. A photographic process comprising providing a layer of a viscous aqueous alkaline processing composition between a first sheet-like element and a second sheet-like element; said first sheet-like element comprising an opaque support carrying an exposed silver halide emulsion; said second sheet-like element comprising a transparent support carrying an image-receiving layer; said processing composition comprising a light-reflecting pigment and at least one light-absorbing optical filter agent, said optical filter agent being a pH-sensitive dye; said application of said processing composition being effective to develop said exposed silver halide emulsion and to form a visible image in said image layer, the combination of said light-reflecting pigment and said optical filter agent being effective to prevent transmission through said processing composition layer of light actinic to said silver halide emulsion during development thereof; the layer of said second sheet-like element in contact with said processing composition layer containing a substantially nondiffusible decolorizing agent adapted to reduce, without pH reduction, the light-absorbing ability of said optical filter agent immediately adjacent the interface between said layer and said processing composition without reducing the light-absorbing ability of said optical filter agent within said processing composition, whereby the transmission density of said processing composition layer is substantially unchanged but the surface of said processing composition layer viewable through said transparent support appears substantially white substantially immediately after said processing composition is applied.

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## 4,298,675
## NOVEL POLYMERIC MORDANTS FOR PHOTOGRAPHIC DYES

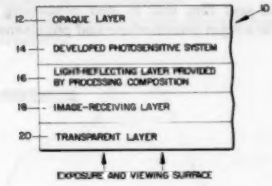
**Lloyd D. Taylor, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.**

**Filed Dec. 3, 1979, Ser. No. 99,755**

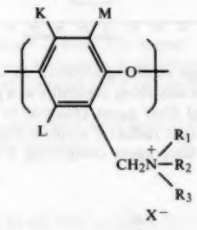
**Int. Cl.³ G03C** *1/40, 5/54, 7/00*

**U.S. Cl. 430—213** **50 Claims**

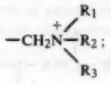
**1**. A diffusion transfer film unit which comprises a photosensitive system comprising at least one photosensitive silver halide emulsion layer having associated therewith a diffusion transfer process image dye-providing material and an image-receiving layer adapted to receive an image dye-providing material after photoexposure and processing, said image-




receiving layer comprising a linear aromatic polymeric mordant having recurring phenylene ether units of the formula:



where K and L are independently hydrogen; lower alkyl; cycloalkyl; lower alkoxy; aryl; aryloxy; aralkyl; alkaryl; or halogen; M is hydrogen; lower alkyl; cycloalkyl; lower alkoxy; aryl; aryloxy; aralkyl; alkaryl; halogen; or



$R_1$, $R_2$, and $R_3$ are independently lower alkyl; substituted lower alkyl; aryl; cycloalkyl; aralkyl; alkaryl; or at least two of $R_1$, $R_2$, and $R_3$ and the nitrogen atom to which they are bonded constitute a substituted or unsubstituted N-containing heterocyclic ring; and $X^-$ is an anion.

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## 4,298,676
## OPTICAL FILTER AGENTS AND PHOTOGRAPHIC PRODUCTS AND PROCESSES CONTAINING SAME

**Derek H. R. Barton, Gif-sur-Yvette, France; Irena Y. Bronstein-Bonte, Newton, and Lloyd D. Taylor, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.**

**Filed Oct. 29, 1979, Ser. No. 89,559**

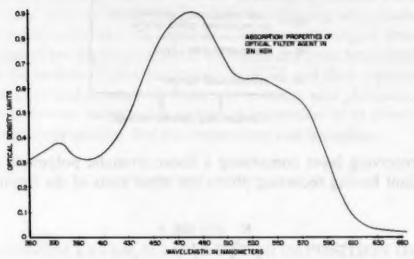
**Int. Cl.³ G03C** *1/40, 1/84, 1/10, 5/54*

**U.S. Cl. 430—221** **45 Claims**

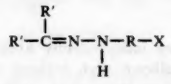
**4**. A photographic film unit for forming a diffusion transfer image which comprises in combination:

a photosensitive element comprising an opaque support carrying at least one photosensitive silver halide emulsion layer, each said silver halide emulsion layer having associated therewith a dye image-forming material; an image-receiving element comprising a transparent support carrying at least a polymeric image-receiving layer dyeable by said dye image-forming material, said image-receiving element being adapted to exposure therethrough of said photosensitive element and being in a superposed fixed relation to said photosensitive element with said supports outermost; a rupturable container releasably holding an aqueous alkaline processing composition, said rupturable container being positioned so as to release said processing composition for distribution between said dyeable poly-

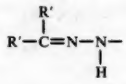
meric layer and said photosensitive element adjacent thereto upon application of pressure to said container after photoexposure of said photosensitive element; and disposed in said film unit in said processing composition and/or in a layer intermediate said photosensitive element




and said image-receiving element, an optical filter agent having a light-absorbing capability at a pH above the pKa of the optical filter agent effective to absorb at least a portion of actinic radiation within a predetermined range, said optical filter agent comprising a compound of the formula:



where R is a group which provides a carbon-to-carbon double bond for conjugation with the



portion of the compound to provide said light-absorbing capability for the compound at a pH above the pKa of the compound, X represents a substituent of R providing at least one electron-withdrawing group and each R′ is a substituent which does not impair the light-absorbing capability of the compound at a pH above the pKa of the compound or both R′ groups together complete a cyclic moiety which does not impair said light-absorbing capability.

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**4,298,677**

## DIFFUSION TRANSFER PHOTOGRAPHIC PROCESS

**Yoshihiro Takagi, and Masakado Sakai, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan**

**Filed Jun. 9, 1980, Ser. No. 158,035**
**Claims priority, application Japan, Jun. 7, 1979, 54-72102**
**Int. Cl.³ G03C *5/54***
**U.S. Cl. 430—244** **13 Claims**

**1**. A diffusion transfer photographic process comprising imagewise exposing a silver halide photosensitive emulsion layer and processing with an alkali processing solution in the presence of a silver halide solvent, a silver halide developing agent, said silver halide of said emulsion layer, and a development solubilization promoter that forms an insoluble complex compound by reaction with said silver halide of said emulsion layer, to form a black and white negative transfer image on an image-receiving layer,

wherein the improvement comprises using a silver halide photosensitive emulsion layer wherein the silver halide in the emulsion layer is silver iodobromochloride or silver iodobromide wherein the iodide comprises from 10 to 20 mole% of the halide content thereof.

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**4,298,678**

## PHOTOSENSITIVE COMPOSITIONS AND ELEMENTS CONTAINING SUBSTITUTED HYDROXYLAMINE

**Mark R. McKeever, Sayre, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Filed Aug. 14, 1980, Ser. No. 178,089**
**Int. Cl.³ G03C *1/52, 1/68***
**U.S. Cl. 430—281** **16 Claims**

**1**. A photosensitive composition comprising an admixture of

(A) a photooxidant compound,

(B) a leuco dye that is oxidizable to dye by the photooxidant, and

(C) a hydroxylamine compound of the formula $R_1R_2NOH$, and acid salts thereof, wherein each of $R_1$ and $R_2$ can be hydrogen with the proviso that both cannot be hydrogen, a linear or branched-chain alkyl group of 2 to 14 carbon atoms, a cyclic alkyl group of 5 to 14 carbon atoms, an aryl group of 6 to 10 carbon atoms, an aralkyl group wherein the aryl moiety is of 6 to 10 carbon atoms and the alkyl moiety is of 1 to 14 carbon atoms, and an alkaryl group wherein the aryl moiety is of 6 to 10 carbon atoms and the alkyl moiety is of 1 to 9 carbon atoms, and $R_1$ and $R_2$ when taken together may with the nitrogen atom form a heterocyclic ring of 5 to 7 carbon atoms.

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**4,298,679**

## LIGHT-SENSITIVE COMPOSITION

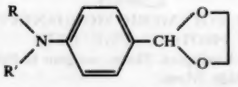
**Fumiaki Shinozaki; Yasuo Washigawa; Tomoaki Ikeda; Sho Nakao, and Syunichi Kondoh, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**Division of Ser. No. 832,864, Sep. 13, 1977, Pat. No. 4,175,971.**
**This application Jul. 12, 1979, Ser. No. 57,149**
**Claims priority, application Japan, Sep. 14, 1976, 51-110151**
**Int. Cl.³ G03C *1/68***
**U.S. Cl. 430—281** **4 Claims**

**1**. A light-sensitive composition consisting essentially of at least one ester of an ethylenically unsaturated double bond-containing organic acid and an aliphatic polyhydric alcohol, said ester having a molecular weight of about 1000 or less, and a photopolymerization initiator, said photopolymerization initiator consisting essentially of a combination of the components

(1) benzanthrone, a benzanthrone substituted with one or more of halogen atoms, alkyl groups having 1 to 5 carbon atoms or alkoxy groups having 1 to 5 carbon atoms, a 1,2-benzanthraquinone or a benzanthraquinone substituted with one or more of halogen atoms, alkyl groups having 1 to 5 carbon atoms or alkoxy groups having 1 to 5 carbon atoms, or a mixture thereof and

(2) a compound represented by the following general formula (c)


(c)

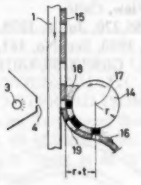
wherein R and R′, which may be the same or different, each represents a methyl group or an ethyl group, wherein the weight ratio of component (1) to component (2) of said photopolymerization initiator ranges from about 10:1 to about 1:100 and the amount of said photopolymerization initiator ranges from about 0.1 to about 20% by weight to the weight of the ester.

**4,298,680**

## METHOD AND APPARATUS FOR MANUFACTURING SEAMLESS PRINTING ROLL

**Vogel Bruno, Einbec, Fed. Rep. of Germany, assignor to N.V. APR Europe S.A., Brussels, Belgium**

**Filed Dec. 28, 1979, Ser. No. 108,096**
**Claims priority, application Japan, Feb. 14, 1979, 54-15824**
**Int. Cl.³ G03C *5/00*; G03B *27/04, 27/22***
**U.S. Cl. 430—300** **14 Claims**




1. A method in which a photosensitive layer is formed on a process cylinder to a predetermined thickness and simultaneously subjected to image-forming exposure for manufacturing a seamless printing roll comprising the steps of supplying a photosensitive liquid-type resin to the space between a process cylinder and a rigid plate which is transparent to actinic light, providing a relative translational movement between said rigid plate and a rotational axis of said cylinder, simultaneously rotating said cylinder in synchronization with said translational movement, and, exposing said photosensitive layer in said space.

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**4,298,681**

## N,N DISUBSTITUTED P-PHENYLENEDIAMINE PHOSPHATES TO FORM A COLOR DEVELOPER WORKING SOLUTION, A COLOR DEVELOPER CONCENTRATE CONTAINING SUCH A PHOSPHATE AND A METHOD OF USING SAID WORKING SOLUTION FOR COLOR DEVELOPMENT OF COLOR FILM

**David K. Bulloch, Hillsdale, and Hong Z. Kim, Bergenfield, both of N.J., assignors to Philip A. Hunt Chemical Corp., Palisades Park, N.J.**

**Filed Feb. 23, 1973, Ser. No. 335,343**
**The portion of the term of this patent subsequent to Apr. 1, 1992, has been disclaimed.**
**Int. Cl.³ G03C *5/30***
**U.S. Cl. 430—466** **7 Claims**

1. A stable color developer concentrate essentially consisting of a concentrated water solution of a 4-amino-N-ethyl, N-beta methanesulfonamidoethyl-[n]m-toluidene salt of a phosphoric acid selected from the group consisting of orthophosphoric acid, pyrophosphoric acid and polyphosphoric acid containing the equivalent of from about 105% to about 115% orthophosphoric acid, said salt being present in an amount such that the 4-amino-N-ethyl, N-beta methanesulfonamidoethyl-[n]m-toluidene constitutes from 50% to 65% weight per unit volume of the concentrate.

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**4,298,682**

## PHOTOGRAPHIC ELEMENT HAVING OVERCOATING OF IONIC POLYESTER IN HYDROPHILIC COLLOID

**John F. Bishop, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Aug. 1, 1980, Ser. No. 174,421**
**Int. Cl.³ G03C *1/76***
**U.S. Cl. 430—533** **11 Claims**

1. In a photographic element comprising a support having thereon at least one photosensitive silver halide emulsion layer having associated therewith a dye image-providing material, the improvement wherein said element has, over said emulsion layer, an overcoat layer comprising an ionic polyester in a hydrophilic colloid at a weight ratio of 1:5 to 10:1, said polyester comprising recurring units of:

(I) a diol component which comprises:

(a) at least 50 mole percent of units derived from diols having the structures:

(i)

wherein n is an integer of from 1 to 4; and

(ii) O—(RO)—$_m$, wherein m is an integer of from 2 to 4, and R is an alkylene group of 2 to about 4 carbon atoms; and

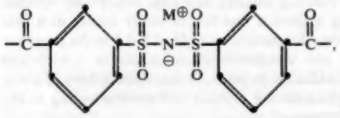
(b) 0 to 50 mole percent of units derived from one or more diols having the structure:

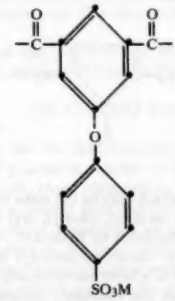
—O—$R^1$—O—

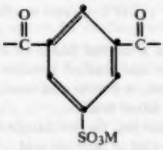
wherein $R^1$ is an alkylene group of up to about 16 carbon atoms, a cycloalkylene group of 6 to about 20 carbon atoms, a cycloalkylenebisalkylene group of 8 to about 20 carbon atoms, an arylenebisalkylene group of 8 to about 20 carbon atoms, or an arylene group of 6 to about 12 carbon atoms; and

(II) an acid component which comprises:

(a) 8 to 30 mole percent of units derived from one or more ionic dicarboxylic acids, said units having the structures:






, and

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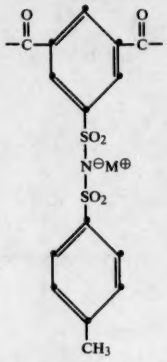

wherein M is ammonium or a monovalent metal; and

(b) 70 to 92 mole percent of recurring units derived from other diacids.

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**4,298,683**

**LIGHT-SENSITIVE PHOTOGRAPHIC MATERIAL**

**Manfred Becker; Angela Slabik, both of Leverkusen; Bruno Mücke, Bergisch-Gladbach; Erik Moisar, Cologne, and Harald von Rintelen, Leverkusen, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Bayerwerk-Leverkusen, Fed. Rep. of Germany**

**Continuation-in-part of Ser. No. 971,501, Dec. 20, 1978, abandoned. This application Jul. 6, 1979, Ser. No. 55,481**

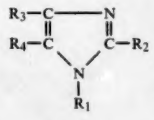
**Claims priority, application Fed. Rep. of Germany, Dec. 29, 1977, 2758711**

**Int. Cl.[3] G03C *1/52***

**U.S. Cl. 430—569** **8 Claims**

**8**. A process for the preparation of photographic materials having at least one light-sensitive silver halide emulsion layer of silver halide grains

comprising the steps of first precipitating silver halide crystals from a reaction mixture in a first precipitate volume, and forming a limited number of silver nuclei in a first phase of crystal formation, at a pH of 5–6.5 in the presence of at least one water-soluble imidazole in a sufficient amount of imidazole to produce increased grains of silver halide as light-sensitive crystals and corresponding to the following formula:



in which

$R^1$, $R^2$, $R^3$ and $R^4$ which may be the same or different represent hydrogen or an alkyl, alkenyl, aryl or aralkyl group which may be substituted by hydroxyl, cyano and alkoxy groups and free or esterified carboxyl and/or sulfoalkyl groups and is free of a heteroaromatically bound nitrogen, and together with the imidazole nucleus could form a multiple ligand for silver ions, nor contains a thia group —S—;

immediately growing in a second phase of crystal formation silver halide crystals on said limited number of nuclei in the presence of said imidazole, wherein said imidazole inhibits the formation of additional silver nuclei.

and subsequently removing the imidazole from the second ripening volume so that to provide said silver halide emulsion free of a heteroaromatically bound nitrogen and then casting the imidazole-free emulsion on a support.

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**4,298,684**

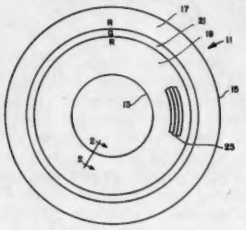
**REFLECTIVE DATA STORAGE MEDIUM MADE BY SILVER DIFFUSION TRANSFER IN SILVER-HALIDE EMULSION INCORPORATING NUCLEI**

**Eric W. Bouldin, Woodside, and Jerome Drexler, Los Altos Hills, both of Calif., assignors to Drexler Technology Corporation, Mountain View, Calif.**

**Division of Ser. No. 55,270, Jul. 6, 1979. This application Jun. 20, 1980, Ser. No. 161,342**

**Int. Cl.[3] G03C *5/54*; G02B *27/22***

**U.S. Cl. 430—616** **1 Claim**



**1**. A method of making a reflective laser recording medium from an unexposed photosensitive silver-halide emulsion layer incorporating a surface layer of high volume concentration silver precipitating nuclei having a size primarily less than five hundredths of a micron therein, the emulsion being disposed on a substrate with the nuclei layer disposed in said emulsion comprising,

defining laser recording area in the silver-halide emulsion,

contacting the unexposed and undeveloped photosensitive silver-halide emulsion layer incorporating the surface layer of silver precipitating nuclei with an aqueous monobath comprising a weak silver-halide developing agent and a rapid-acting silver-halide solvent for reacting with unexposed and undeveloped silver halide to form soluble silver ion complexes which are transported by diffusion transfer to the silver precipitating nuclei within said emulsion layer where the silver of said silver ion complexes is precipitated and adsorbed on said nuclei in the presence of said developer acting as a reducing agent, to the extent that a layer of aggregate and individual silver particles is formed exhibiting reflectivity of at least 15%.

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**4,298,685**

**DIAGNOSTIC REAGENT**

**Indu Parikh, and Pedro Cuatrecasas, both of Chapel Hill, N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.**

**Filed May 3, 1979, Ser. No. 35,619**

**Claims priority, application United Kingdom, May 4, 1978, 17749/78**

**Int. Cl.[3] C12N *9/96*; G01N *33/54***

**U.S. Cl. 435—7** **18 Claims**

**1**. A process for the quantitative determination of a biological substance in a test sample comprising,

(a) mixing said test sample, a soluble enzyme-labelled form of said biological substance, and a soluble biotin-tagged antibody raised against said biological substance,

(b) incubating the mixture under conditions suitable for forming an antibody-biological substance complex,

(c) then adding isolubilized avidin, separating the resulting solid phase from the liquid phase, and

(d) determining the enzyme activity of either of said phases.

**11**. A kit for use in enzyme immunoassay comprising,

(a) a quantity of enzyme-labelled biological substance,
(b) a quantity of biotin-tagged antibody raised against said biological substance,
(c) a quantity of insolubilized avidin, and
(d) a quantity of substrate for said enzyme,
wherein said quantity of biotin tagged antibody is sufficient to bind a substantial quantity of the enzyme-labelled substance, said quantity of insolubilized avidin is present in excess of the amount required to precipitate the biotin tagged antibody, and said quantity of said substrate is sufficient to react with said enzyme label to produce a detectable signal.

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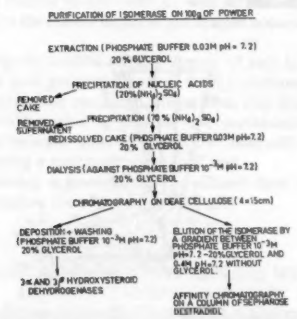
**4,298,686**

## METHOD OF IMMUNOENZYMATIC ASSAY UTILIZING $\Delta_5$,3-KETO-STEROID ISOMERASE

**Jean C. Nicolas; Beatrice Terouanne; Bernard Descomps, and Andre C. De Paulet, all of Montpellier, France, assignors to Institut National de la Sante et de la Recherche Medicale (INSERM), Paris, France**

**Filed Jul. 25, 1979, Ser. No. 60,677**
**Claims priority, application France, Aug. 2, 1978, 78 22867**
**Int. Cl.[3] G01N *33/54*; C12N *9/96***
**U.S. Cl. 435—7** **16 Claims**


PURIFICATION OF ISOMERASE ON 100g OF POWDER
EXTRACTION (PHOSPHATE BUFFER 0.03M pH = 7.2) 20 % GLYCEROL
PRECIPITATION OF NUCLEIC ACIDS (20% $(NH_4)_2SO_4$)
REMOVED CAKE
PRECIPITATION (70 % $(NH_4)_2SO_4$)
REMOVED SUPERNATANT
REDISSOLVED CAKE (PHOSPHATE BUFFER 0.03M pH=7.2) 20 % GLYCEROL
DIALYSIS (AGAINST PHOSPHATE BUFFER $10^{-3}$M pH = 7.2) 20% GLYCEROL
CHROMATOGRAPHY ON DEAE CELLULOSE (4×15cm)
DEPOSITION + WASHING (PHOSPHATE BUFFER $10^{-3}$M pH=7.2) 20% GLYCEROL
ELUTION OF THE ISOMERASE BY A GRADIENT BETWEEN PHOSPHATE BUFFER $10^{-3}$M pH=7.2 -20%GLYCEROL AND 0.4M pH=7.2 WITHOUT GLYCEROL
3α AND 3β HYDROXYSTEROID DEHYDROGENASES
AFFINITY CHROMATOGRAPHY ON A COLUMN OF SEPHAROSE DIESTRADIOL

**1**. In an enzyme immuno assay for a peptide wherein a sample suspected of containing said peptide is admixed with an assay reagent containing an antibody capable of binding said peptide and a peptide-enzyme conjugate under conditions such that a bound species and a free species of said enzyme-conjugate are formed and wherein the enzymatic activity of the bound and/or free species is determined, the improvement comprising: using a $\Delta_5$, 3-keto-steroid isomerase-peptide as the enzyme-peptide conjugate, wherein the conjugate is prepared by reacting the peptide with methyl-4-mercapto-butyrimide, reacting $\Delta_5$, 3-keto-steroid isomerase with S-acetylmercaptosuccinic anhydride; and then coupling the resulting products by a disulfide bridge to form the conjugate containing one mole of peptide and one mole of enzyme.

**12**. In an enzyme immuno assay for a steroid wherein a sample suspected of containing said steroid is admixed with an assay reagent containing an antibody capable of binding said steroid and a steroid-enzyme conjugate under conditions such that a bound species and a free species of said enzyme-conjugate are formed and wherein the enzymatic activity of the bound and/or free species is determined, the improvement comprising: using a $\Delta_5$, 3-keto-steroid isomerase-steroid as the enzyme-steroid conjugate, wherein the conjugate is prepared by reacting the steroid with bromoacetic acid, reacting $\Delta_5$, 3-keto-steroid isomerase with S-acetylmercaptosuccinic anhydride; and then coupling the resulting products by a thiol bridge to form the conjugate.

**15**. A reagent for use in an enzyme immuno assay for a peptide comprising $\Delta_5$, 3-keto-steroid isomerase from *P. testosteroni*, having free -SH groups and having a specific activity higher than 30,000 IU/mg, coupled to the peptide, wherein coupling to the peptide is effected by reacting the peptide with methyl-4-mercapto-butyrimide, reacting said isomerase with S-acetylmercaptosuccinic anhydride; and then coupling the resulting products by a disulfide bridge to form a conjugate containing one mole of peptide and one mole of enzyme.

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**4,298,687**

## PROCESS FOR THE DETERMINATION OF COMPOUNDS SHOWING AMONG THEMSELVES SPECIFIC BINDING AFFINITIES BY THE USE OF A SOLID PHASE

**Roland Maes, 2, Ave. d'Alsace, 67 000 Strasburg, France**

**Filed Oct. 16, 1979, Ser. No. 85,438**
**Claims priority, application France, Oct. 31, 1978, 78131279**
**Int. Cl.[3] C12Q *1/66***
**U.S. Cl. 435—7** **9 Claims**

**1**. A process for the determination of compounds having specific binding affinities by the steps comprising adding to a solution containing the compound to be determined, a soluble primary binding partner capable of specific binding affinity with such compound and in a predetermined amount exceeding the quantity of the compound to be determined, whereby excess primary binding partner remains free in solution after completion of the specific binding reaction; specifically adsorbing such excess specific binding partner in a solid phase consisting of a polyacrylamide gel which has been activated by a dialdehyde, a trioxane, or paraldehyde and then sensitized by a compound having specific binding affinity for the primary binding partner, the amount of said sensitized solid phase being sufficient to adsorb thereon all of said excess primary binding partner; deactivating the thus-sensitized solid phase with a deactivating compound carrying $NH_2$ groups, chosen among the group consisting of hydroxylamine, acrylamide, glutamine, acetamide and formamide and then revealing the extent of said adsorption of said excess primary binding partner on said sensitized solid phase by reacting the adsorbed primary binding partner with a labeled binding partner having specific binding affinity for said primary binding partner and measuring the amount of reacted labeled binding partner.

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**4,298,688**

## TEST DEVICE FOR THE DETECTION AND DETERMINATION OF GLUCOSE

**Karl-Heinz Kallies, Sebnitz, German Democratic Rep., assignor to Veb Arzneimittelwerk Dresden, Radebeul, German Democratic Rep.**

**Filed Aug. 20, 1979, Ser. No. 68,323**
**Claims priority, application German Democratic Rep., Jul. 25, 1978, 206900**
**Int. Cl.[3] C12Q *1/54***
**U.S. Cl. 435—14** **11 Claims**

**1**. A test strip for the detection and determination of the concentration of glucose in samples of body fluids containing in addition Albumin, blood pigments or Vitamin C as interferants comprising, a carrier strip capable of transporting fluid therealong and which is separated into three zones arranged one above the other in the order indicated: (a) a measuring zone for receiving a predetermined amount of the test sample impregnated with at least one member of the group consisting of marking agents, coloring agents, oxidation agents, buffers and precipitating agents for binding and elimination of interferants, (b) a reaction zone containing glucose oxidase that will catalyze the oxidation of a glucose substiate, and (c) a detection zone containing peroxidase and an indicator for providing a visible response for accurately determining the level of glucose in the test sample.

**4,298,689**

## GONORRHEA DIAGNOSTIC TEST

**Ronald J. Doyle, Jefferson Town; Kenneth F. Keller, Anchorage, and Robert L. Schaefer, Louisville, all of Ky., assignors to Research Corporation, New York, N.Y.**

**Filed Sep. 25, 1978, Ser. No. 945,211**

**Int. Cl.[2] C12Q *1/04***

**U.S. Cl. 435—34** **18 Claims**

1. A method for detecting the presence of *Neisseria gonorrhoeae* microorganisms which comprises contacting, at a pH of from 4 to 10, a sample suspected of containing a *Neisseria gonorrhoeae* microorganism with a plant lectin, the said lectin being characterized as one which reacts specifically with N-acetylglucosamine and testing resulting mixture for the presence of a reaction product formed by reaction between the lectin and N-acetylglucosamine on the cell surface of said *Neisseria gonorrhoeae* microorganism, wherein the presence of such reaction product is a presumptive indication of the presence of a *Neisseria gonorrhoeae* microorganism.

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**4,298,690**

## ANTIBIOTICS XK-62-3 AND XK-62-4 AND PROCESS FOR PRODUCTION THEREOF

**Takao Iida, Tokyo; Kunikatsu Shirahata, Machida; Shinzo Ishii, Shizuoka; Ryo Okachi, Machida, and Takashi Nara, Tokyo, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan**

**Filed May 16, 1978, Ser. No. 906,333**

**Claims priority, application Japan, May 19, 1977, 52-57827; Jul. 13, 1977, 52-83038**

**Int. Cl.[3] C12P *19/48;* C12N *1/20;* C12R *1/29***

**U.S. Cl. 435—80** **10 Claims**

1. A process for producing antibiotic compounds XK-62-3 and XK-62-4, which comprises culturing a microorganism of the genus Micromonospora and which is capable of producing at least one of said compounds in a nutrient medium until substantial antibacterial activity is detected in the culture liquor and thereafter isolating at least one of said compounds therefrom.

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**4,298,691**

## PREPARATION OF HETEROPOLYSACCHARIDE S-156

**George T. Veeder, San Diego, and Kenneth S. Kang, LaJolla, both of Calif., assignors to Merck & Co., Inc., Rahway, N.J.**

**Filed Sep. 5, 1980, Ser. No. 184,597**

**Int. Cl.[3] C12P *19/04***

**U.S. Cl. 435—101** **7 Claims**

1. A process for producing heteropolysaccharide S-156 which comprises growing the organism ATCC 31646 in an aqueous nutrient medium by aerobic fermentation of an assimilable carbohydrate source and recovering said heteropolysaccharide S-156.

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**4,298,692**

## FERMENTATION PROCESS FOR PRODUCING A RIFAMYCIN DERIVATIVE

**Thomas Schupp, Möhlin; Peter Traxler, Allschwil, and Jakob Nüesch, Arlesheim, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

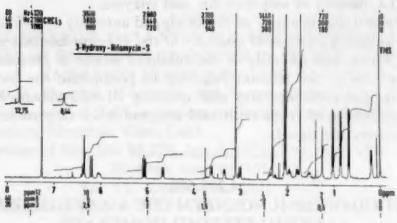
**Filed Jan. 17, 1980, Ser. No. 112,898**

**Claims priority, application Switzerland, Jan. 25, 1979, 750/79; Jun. 21, 1979, 5804/79**

**Int. Cl.[3] C12P *17/18***

**U.S. Cl. 435—119** **5 Claims**

1. A process for the production of a rifamycin derivative by cultivating, under aerobic conditions in an aqueous nutrient medium containing a carbon source, a nitrogen source and mineral salts, a strain of *Nocardia mediterranei*, which is derived from *Streptomyces mediterranei* ATCC 13 685 as the parent strain, characterised in that a recombinant strain Nocardia mediterranei which is resistant to streptomycin and autotrophic with respect to amino acids is cultivated and at least one compound of the group consisting of 3-hydroxyrifamycin S, 3,31-dihydroxyrifamycin S and 1-desoxy-1-oxarifamycin S,



is isolated from the fermentation medium by physico-chemical means of separation.

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**4,298,693**

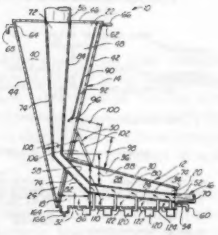
## FERMENTATION APPARATUS

**Michael W. Wallace, Rt. 2, Box 53, Dustin, Okla. 74839**

**Filed Jul. 29, 1980, Ser. No. 173,356**

**Int. Cl.[3] C12M *1/02, 1/12***

**U.S. Cl. 435—305** **33 Claims**



1. A fermentation apparatus for continuous fermentation of a sugar containing material to produce beer, the fermentation apparatus comprising:

a substantially horizontally disposed fermentation chamber having a first end and a second end;

a substantially vertically disposed separation chamber having an upper end and a lower end, the lower end of the separation chamber connected to the first end of the fermentation chamber such that the separation chamber is in fluid communication with the fermentation chamber;

mash directing means disposed in the fermentation chamber and the separation chamber, having a first end adjacent the second end of the fermentation chamber and having a second end adjacent the upper end of the separation chamber, for directing mash introduced at the first end through the fermentation chamber and out of the fermentation chamber adjacent its second end, and for directing such mash into the separation chamber adjacent its lower end, and for directing such mash through the separation chamber and out the separation chamber at the second end of the mash directing means, the mash directing means being adapted to retain the mash therein;

mash transporter means for powering movement of mash from the first end to the second end of the mash directing means;

circulating means for circulating a yeast-containing slurry in the fermentation chamber into contact with the mash in the mash directing means; and

gas separating means positioned within the separation chamber for collecting gases generated by fermentation of the mash and separating such gases from the beer so produced.

4,298,694

## PROCESS AND A PLANT FOR PREPARING A GAS RICH IN METHANE

Allan Skov, Lyngby, Denmark, assignor to Haldor Topsoe A/S, Lyngby, Denmark

Filed Dec. 3, 1979, Ser. No. 99,361
Claims priority, application Denmark, Dec. 12, 1978, 55711/78
Int. Cl.³ C07C 1/04
U.S. Cl. 518—704 6 Claims

1. A process for preparing a methane-rich gas mixture by catalytic treatment at elevated temperature and pressure of a feed gas which contains hydrogen as the predominant component, is rich in carbon oxides and optionally contains gases selected from the class consisting of nitrogen and the inert gases, comprising the steps of

(a) dividing the feed gas into two streams, viz. a first feed gas part stream comprising 30–70% by volume of the total feed gas stream and a second feed gas part stream comprising the remainder of the feed gas,

(b) subjecting the first feed gas part stream to a catalytic methanation in at least one adiabatic methanation reactor containing a methanation catalyst,

(c) cooling the effluent gas stream from the adiabatic methanation reactor to 250°–400° C. with saturated steam produced in the cooled methanation reactor according to step (e),

(d) mixing the cooled effluent stream of step (c) with the second feed gas part stream to form a combined stream,

(e) subjecting the combined stream from step (d) to a catalytic methanation in at least one methanation reactor cooled by water under production of saturated steam and, containing a methanation catalyst, and

(f) recovering at least part of the effluent from the cooled methanation reactor as a product gas.

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4,298,695

## CONVERSION OF SYNTHESIS GAS WITH IRON-CONTAINING CATALYST

Stephen A. Butter; Arthur W. Chester, both of Cherry Hill, N.J., and Albert B. Schwartz, Philadelphia, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 970,300, Sep. 18, 1978, abandoned. This application Feb. 11, 1980, Ser. No. 120,243
Int. Cl.³ C07C 1/00
U.S. Cl. 518—720 10 Claims

1. A process for converting synthesis gas comprising carbon monoxide and hydrogen to a naphtha having a boiling range of less than 400° F. at a 90% overhead while producing no more than 30 weight percent of methane plus ethane, based on total hydrocarbons, which comprises:

a. contacting said synthesis gas at a temperature of from about 500° to 600° F. and at a pressure of from 50–1000 psig with a catalyst composition prepared by forming a homogenous mixture of either metallic iron powder or iron oxide powder having a particle size no greater than about 200 microns, a hydrogel matrix and an acidic crystalline aluminosilicate zeolite having a silica-to-alumina ratio of at least 12, a pore size greater than about 5 Angstrom units, and a constraint index of about 1 to 12, drying said mixture and treating it with carbon monoxide or synthesis gas mixtures containing carbon monoxide and hydrogen at atmospheric pressure and at temperatures of about 550°–650° F. for periods of time ranging from about ½ hour up to about 24 hours, provided that said dried mixture is calcined in an oxygen-containing gas at temperatures ranging from about 250° F. to about 1100° F. prior to said carbon monoxide treatment when metallic iron is employed to form said mixture and

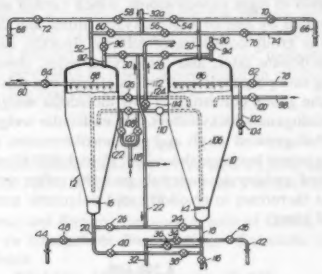
b. obtaining said naphtha in an amount which is at least 50 weight percent of the total hydrocarbons produced.

4,298,696

## REGENERATION OF ION EXCHANGE MATERIALS

James R. Emmett, Brewood, England, assignor to Northern Engineering Industries, Ltd., New Castle upon Tyne, England

Continuation-in-part of Ser. No. 907,029, May 17, 1978, abandoned. This application Mar. 31, 1980, Ser. No. 135,920
Claims priority, application United Kingdom, May 27, 1977, 22417/77
Int. Cl.³ B01J 49/00
U.S. Cl. 521—26 11 Claims



6. A method of performing repeated cycles of regeneration of anion and cation ion exchange materials comprising in each cycle passing a mixture of the materials into a separator vessel containing a perforate barrier beneath the materials and having an elongate conduit having an inlet adjacent the barrier and an outlet within a second vessel above a perforate barrier therein, passing water upwardly within the separator vessel to classify the materials into superimposed uppermost, intermediate and lowermost layers, passing water into said separator vessel and upwardly through said barrier and concurrently causing water to flow through said conduit to transfer material from said separator vessel to said second vessel, automatically operating valve means to isolate said outlet from said inlet in response to automatic detection of a fall in conductivity of the flow through the conduit caused by a transition between cation and anion materials and after a first volume being at least a major proportion of material of the lowermost layer has passed into said second vessel and so as to segregate a second volume being material from the intermediate layer, the flow from said separator vessel being diverted, after said valve means has operated, to pass said second volume initially into said conduit and thence into a third vessel, regenerating and re-mixing the materials of the uppermost and lowermost layers and returning them to service while said second volume is segregated, and returning material from said third vessel to said separator vessel to be joined by exhausted materials for regeneration therewith in the next regeneration cycle.

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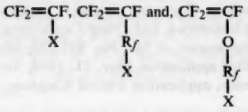
4,298,697

## METHOD OF MAKING SHEET OR SHAPED CATION EXCHANGE MEMBRANE

Stanley K. Baczek, and G. Howard McCain, both of Painesville, Ohio, assignors to Diamond Shamrock Corporation, Dallas, Tex.

Filed Oct. 23, 1979, Ser. No. 87,331
Int. Cl.³ C08K 5/02; C08J 5/22
U.S. Cl. 521—27 16 Claims

1. A method of forming shaped polymeric material polymerized from at least two monomers, one said monomer consisting essentially of at least one fluorinated vinyl compound and said other monomer consisting essentially of at least one monomer of the structure



wherein $R_f$ is a bifunctional perfluorinated radical containing from two to eight carbon atoms, which carbon atoms may be interrupted by one or more oxygen atoms and X is selected from the group consisting of sulfonyl fluoride, carbonyl fluoride, sulfonate ester, and carboxylate ester, comprising: dissolving said polymeric material in at least one solvent selected from the group consisting of low molecular weight polymers of perhalogenated alkylethers, low molecular weight polymers of perhalogenated alkyls and perfluorokerosenes, each having boiling points between about 200° C. and 350° C.; shaping said dissolved polymeric material; and thereafter stripping said solvent therefrom to resolidify said polymeric material in the shaped form.

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**4,298,698**

## METHOD FOR MANUFACTURE OF ION-EXCHANGE GRAFT MEMBRANE

**Kaoru Kawase, Nagoya, and Kiyoshi Hayakawa, Gifu, both of Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan**

**Filed Oct. 30, 1979, Ser. No. 89,402**

**Claims priority, application Japan, Nov. 6, 1978, 53-137145**

**Int. Cl.³ B01J *47/12;* C08F *2/54***

**U.S. Cl. 521—27** **9 Claims**

1. A method for the manufacture of an ion-exchange graft polymer membrane without the use of an organic solvent, which method comprises:

dissolving in water (a) a hydrophilic polymer selected form the group consisting of polyvinyl alcohol having a polymerization degree of 500 to 2000 and an acetification degree of 0% to 20%, methyl cellulose having a methylation degree of 3% to 10% and ethyl cellulose having an ethylation degree of 10% to 25%, and (b) at least one member selected from the group consisting of the alkali metal salts of α-alkyl acryl acids and alkaline earth metal salts of α-alkyl acryl acids;

pouring the resultant solution onto a substrate and drying the covered substrate such that a film of said hydrophilic polymer is formed in which at least one of said acryl salts is dispersed; and

exposing said film to ionizing high energy radiation or ultraviolet radiation, thereby causing said at least one acryl salt to graft copolymerize onto said hydrophilic polymer within said film.

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**4,298,699**

## PROCESS FOR PRODUCING FLUORINATED POLYMER HAVING ION-EXCHANGE GROUPS

**Tatsuro Asawa; Haruhisa Miyake, both of Yokohama; Masami Yamashita, Yokosuka, and Yoshio Sugaya, Yokohama, all of Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan**

**Filed Feb. 7, 1980, Ser. No. 119,521**

**Int. Cl.³ B01J *39/20***

**U.S. Cl. 521—31** **11 Claims**

1. A process for producing a fluorinated copolymer having ion-exchange groups, comprising:

copolymerizing a fluorinated ethylenic unsaturated monomer and a monomer having a carboxylic acid group or group convertible to a carboxylic acid group in an aqueous solution in the presence of a polymerization initiator:

treating the particles of copolymer product obtained with an alcohol at a temperature greater than 20° C.; and

drying said alcohol treated particles, thereby substantially removing said alcohol from said particles.

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**4,298,700**

## CROSSLINKED BASIC POLYMER AND PREPARATION THEREOF

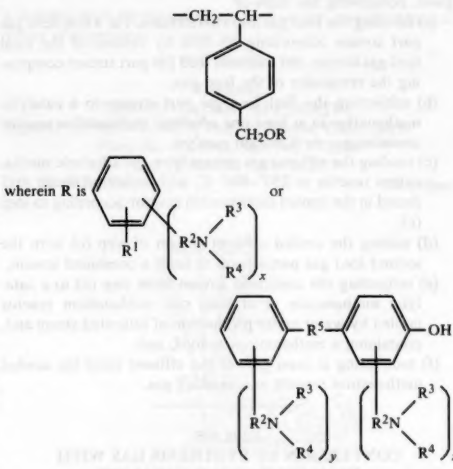
**Kunio Takase, Tochigi, Japan, assignor to Rohm and Haas Company, Philadelphia, Pa.**

**Filed Jun. 8, 1979, Ser. No. 47,182**

**Int. Cl.³ C08F *8/30, 12/26;* B01J *39/20***

**U.S. Cl. 521—32** **11 Claims**

1. A crosslinked basic polymer predominating in repeating units of the formula:



wherein x, y and z are integers of from 1 to 3, $R^1$, $R^3$ and $R^4$ independently are hydrogen or alkyl, and $R^2$ and $R^5$ are each alkylene.

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**4,298,701**

## PROCESS FOR THE PRODUCTION OF ELASTIC SHAPED ARTICLES

**Holger Meyborg, Odenthal, and Christian Weber, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Filed Apr. 14, 1980, Ser. No. 139,921**

**Claims priority, application Fed. Rep. of Germany, Apr. 24, 1979, 2916485**

**Int. Cl.³ C08G *18/14, 18/32***

**U.S. Cl. 521—51** **8 Claims**

1. A process for the production of elastic, shaped articles which comprises reacting a reaction mixture comprising:

(a) organic polyisocyanates;

(b) polyhydroxy polyethers having a molecular weight of from 1,000 to 12,000;

(c) aromatic diamines or polyamines as chain-extending agents; and

(d) catalysts for the reaction between hydroxyl and isocyanate groups;

said reaction mixture being processed as one-shot systems by the reaction injection molding technique and said reactants being used in quantities corresponding to an isocyanate index of from 70 to 130, characterized in that component (b) comprises polyhydroxy polyethers from 10 to 80% by weight of the polyether chains therein consisting of ethylene oxide units and at least 50% of the hydroxyl groups consisting of secondary hydroxyl groups.

4,298,702

## PROCESS FOR THE MANUFACTURE OF FLAME RETARDANT POLYSTYRENE FOAMS

**Klaus Hahn, Lampertheim; Klaus Hinselmann, Mutterstadt; Klaus Halbritter, Mannheim; Walter Rebafka, Eppelheim, and Heinz Weber, Gruenstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany**

**Filed Aug. 4, 1980, Ser. No. 175,157**

**Claims priority, application Fed. Rep. of Germany, Aug. 9, 1979, 2923403**

**Int. Cl.³ C08V** *9/14*

**U.S. Cl. 521—79** **10 Claims**

1. In a process for the manufacture of a flame-retardant polystyrene foam by melting polystyrene in an extruder, mixing the polystyrene at a temperature over 180° C. with 5 weight percent to 20 weight percent, based on the weight of polystyrene, of a volatile blowing agent and 0.5 weight percent to 10 weight percent, based on the weight of polystyrene, of an organic halogen compound extruding the mixture into the surrounding atmosphere, and subsequently cooling the foam, the improvement which comprises adding from 0.01 weight percent to 5 weight percent, based on the weight of polystyrene, of a dialkyl-tin carboxylate, and 0.01 weight percent to 5 weight percent, based on the weight of polystyrene, of a barium and/or cadmium carboxylate to the mixture.

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4,298,703

## FIRE-RETARDANT IMIDE COPOLYMERS

**Adolph V. DiGiulio, and Jack N. Bauer, both of Pittsburgh, Pa., assignors to ARCO Polymers, Inc., Philadelphia, Pa.**

**Division of Ser. No. 147,664, May 7, 1980. This application Dec. 5, 1980, Ser. No. 213,751**

**Int. Cl.³ C08J** *9/00*

**U.S. Cl. 521—88** **6 Claims**

1. A fire-retardant foam composition having a density of between 1 and 10 pounds per cubic foot and consisting of a copolymer of 50 to 95 mole percent of a monovinyl aromatic monomer and 5 to 50 mole percent of an imide derivative of an ethylenically unsaturated dicarboxylic acid monomer, from 10 to 20 parts per hundred parts of copolymer of an at least tribrominated diphenylether, and 4 to 8 parts per hundred parts of copolymer of a metal oxide synergist for the ether.

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4,298,704

## FIRE-RETARDANT MONOCARBOXYLIC ACID AMIDE COPOLYMERS

**Adolph V. DiGiulio, and Jack N. Bauer, both of Pittsburgh, Pa., assignors to ARCO Polymers, Inc., Philadelphia, Pa.**

**Division of Ser. No. 147,036, May 7, 1980. This application Dec. 8, 1980, Ser. No. 214,891**

**Int. Cl.³ C08J** *9/00*

**U.S. Cl. 521—88** **5 Claims**

1. A fire-retardant foam composition having a density of between 1 and 10 pounds per cubic foot and consisting of a copolymer of 50 to 95 mole percent of a monovinyl aromatic monomer and 50 to 5 mole percent of an ethylenically unsaturated monocarboxylic acid amide monomer, from 10 to 20 parts per hundred parts of copolymer of an at least tribrominated diphenylether, and 4 to 8 parts per hundred parts of copolymer of a metal oxide synergist for the ether.

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4,298,705

## RUBBER-MODIFIED FIRE-RETARDANT IMIDE COPOLYMERS

**Adolph V. DiGiulio, Pittsburgh, Pa., assignor to Arco Polymers, Inc., Philadelphia, Pa.**

**Division of Ser. No. 147,665, May 7, 1980. This application Dec. 8, 1980, Ser. No. 214,893**

**Int. Cl.³ C08J** *9/00*

**U.S. Cl. 521—88** **6 Claims**

1. A fire-retardant foam composition having a density of between 1 and 10 pounds per cubic foot and consisting of a rubber-modified copolymer, from 10 to 20 parts per hundred parts of copolymer of an at least tribrominated diphenylether, and 4 to 8 parts per hundred parts of copolymer of a metal oxide synergist for the ether; said rubber-modified copolymer comprising (a) 5 to 40 weight percent of a rubber, selected from the group consisting of homopolymers of the conjugated dienes such as butadiene, isoprene, chloroprene and piperylene; copolymers of said conjugated diene with up to 50 weight percent of one or more monoolefinically unsaturated monomers such as styrene, substituted styrenes, acrylonitrile, methacrylonitrile and isobutylene; ethylenepropylene-diene terpolymer rubbers; acrylate-diene copolymer rubbers; and mixtures thereof and (b) 60 to 95 weight percent of a copolymer of 50 to 95 mole percent of a monovinyl aromatic monomer and 5 to 50 mole percent of an imide derivative of an ethylenically unsaturated dicarboxylic acid monomer.

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4,298,706

## FOAMS PREPARED FROM POLYPROPYLENE RESIN COMPOSITION AND PROCESS FOR PRODUCING SAME

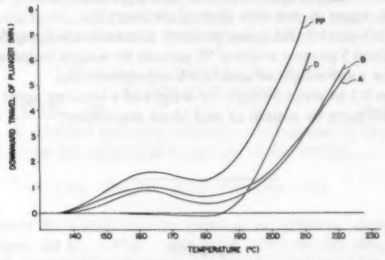
**Takashi Ueno, and Kyoichi Nakamura, both of Osaka, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan**

**Filed Sep. 18, 1979, Ser. No. 76,614**

**Claims priority, application Japan, Sep. 18, 1978, 53-114756**

**Int. Cl.³ B29D** *27/00*

**U.S. Cl. 521—92** **19 Claims**




1. A foam of polypropylene resin composition prepared from a composition comprising a mixture of (1) polypropylene resin and (2) 5–50 parts by weight per 100 parts by weight of the polypropylene resin of 1,2-polybutadiene resin which contains at least 70% of vinyl structure (1,2-bonds) and has an intrinsic viscosity ($\eta$) of at least 0.7 dl/g measured in toluene at 30° C. and a melting point of not lower than 40° C.; the foam being characterized in that it contains hot xylene insoluble thermal reaction products of 1,2-polybutadiene of at least 2% by weight based on the whole composition, and a hot xylene soluble content of 1,2-polybutadiene of up to 30% by weight based on the whole composition.

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4,298,707

## AMINE TERMINATED POLYMERS AND THE FORMATION OF BLOCK COPOLYMERS

**William L. Hergenrother; Richard A. Schwarz; Richard J. Ambrose, all of Akron, and Robert A. Hayes, Cuyahoga, all of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio**

**Division of Ser. No. 848,962, Nov. 7, 1977, Pat. No. 4,151,222, which is a continuation-in-part of Ser. No. 574,676, May 5, 1975, Pat. No. 4,070,344. This application Mar. 5, 1979, Ser. No. 17,788**

**Int. Cl.³ C08J** *9/00*

**U.S. Cl. 521—95** **6 Claims**

1. A nylon block copolymer foam composition, comprising:

an amine terminated polymer connected to a nylon polymer constituent to form the nylon block copolymer composition;

said amine terminated polymer being an end capped polymer formed by the reaction of an anionically prepared polymer and a single polyisocyanate or polyisothiocyanate compound so that at least one unreacted isocyanate or isothiocyanate end portion exists wherein said unreacted isocyanate or isothiocyanate end portion has been converted to an amine group;

said polymer being a homopolymer or a copolymer, said homopolymer made from monomers selected from the class consisting of conjugated dienes and vinyl substituted aromatics, said copolymer made from monomers of conjugated dienes and vinyl substituted aromatics;

said polyisocyanate and said polyisothiocyanate having the formula

$$R\text{-}(\text{-}N{=}C{=}X)_n$$

wherein R is an aliphatic containing from 2 to about 20 carbon atoms, a cycloaliphatic containing from 4 to about 20 carbon atoms, an aromatic containing from 6 to about 20 carbon atoms, and combinations thereof, n is 2 and X is selected from the class consisting of oxygen and sulfur;

said nylon constituent made from monomers selected from the class consisting of (a) anionically polymerizable lactams having from 3 to 15 carbon atoms, (b) diacid chlorides reacted with diamines, and (c) diacids reacted with diamines so that salts thereof are formed;

the amount of said nylon polymer constituent ranging from about 5 percent to about 95 percent by weight based upon the total weight of said block copolymer; and

from 0.5 to about 50 parts by weight of a blowing agent per 100 parts by weight of said block copolymer.

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**4,298,708**

## AMINATED ALKOXYLATED ALIPHATIC ALCOHOL SALTS AS POLYISOCYANURATE CATALYSTS

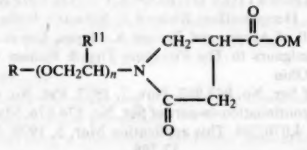
**Heinz Schulze; Robert L. Zimmerman, and Carter G. Naylor, all of Austin, Tex., assignors to Texaco Development Corp., White Plains, N.Y.**

**Division of Ser. No. 26,270, Apr. 2, 1979, Pat. No. 4,235,811. This application May 9, 1980, Ser. No. 148,098**

**Int. Cl.³ C08G *18/14, 18/20***

**U.S. Cl. 521—115** **2 Claims**

**1**. In a process for preparing a cellular polymer containing recurring isocyanurate and urethane linkages, which polymer comprises the reaction product obtained by bringing together in the presence of a blowing agent, a polyether or polyester polyol, and aromatic polyisocyanate, and an isocyanurate group formation catalyst, the improvement which comprises utilizing as said isocyanurate catalyst a salt represented by the following structural formula:



where R is a $C_8$ to $C_{14}$ alkyl groups and mixtures thereof or R′-benzyl where R′ is a $C_6$ to $C_{12}$ alkyl group; R″ is hydrogen or methyl; n is 0 to 20; and M is a Group 1a metal.

**4,298,709**

## POLYHYDROXYL POLYETHER COMPOUNDS CONTAINING PHOSPHORUS AND POLYMERIC RESINS PREPARED THEREFROM

**Sally P. Ginter, Sanford; Chester E. Pawloski, Bay City, and Violete L. Stevens, Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.**

**Filed Jun. 25, 1980, Ser. No. 162,707**

**Int. Cl.³ C08G *18/14***

**U.S. Cl. 521—169** **5 Claims**

**1**. A polymeric condensation resin comprising the reaction product of:

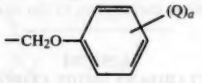
(a) at least one polyhydroxyl polyether of the formula

$$R\{\text{-}[C_2H_3(Y)O\text{-}]_m X\}_n$$

where

R is the residue left by the removal of n active hydrogen atoms from an initiator compound for alkylene oxide polymerization $RH_n$;

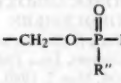
Y is independently —H, —$CH_3$, —$C_2H_5$, —$CH_2Cl$, —$CH_2CCl_3$, —$CH_2Br$,



where Q is independently —Cl or —Br and a = 1-5, or —$CH_2OX$ where X is independently —H or

and R′ and R″ are each independently alkyl, phenyl, haloalkyl, halophenyl, alkoxy, haloalkoxy, polyhaloalkoxy, polyhalophenoxy alkoxy, dialkylamino, arylamino, halophenoxy, or alkylhalophenoxy of up to about 20 carbons;

provided that at least one Y is —$CH_2OH$ and at least one Y is



and

m and n are integers such that m is at least 2, n being 1–8; and

(b) a polyfunctional chain-forming compound containing functional groups reactive with hydroxyl groups of the polyhydroxyl polyether to yield the polymeric condensation resin.

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**4,298,710**

## ANTISTATIC RESIN COMPOSITION

**Masaki Ohya; Akio Kobayashi; Takeo Ogiwara, and Yoshikatsu Satake, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Aug. 30, 1979, Ser. No. 71,377**

**Claims priority, application Japan, Sep. 6, 1978, 53-109285**

**Int. Cl.³ C08F *279/02***

**U.S. Cl. 525—5** **9 Claims**

**1**. An antistatic resin composition with an anti-washing property comprising:

(1) 100 parts of a nitrile copolymer comprising

(A) 7 to 100% of a nitrile graft copolymer with a graft ratio of 4 to 50% obtained by polymerizing

(a) 20 to 95 parts of a monomer mixture of 20 to 90% of an

unsaturated nitrile and 10 to 80% of at least one vinyl and/or vinylidene monomer copolymerizable therewith in the presence of

(b) 5 to 80 parts of a rubber trunk polymer predominantly comprising a conjugated diolefin,

the sum of the quantities of the monomer mixture and the rubber trunk polymer amounting to 100 parts, and

(B) 0 to 93% of a nitrile random copolymer containing 20 to 90% of an unsaturated nitrile; and

(2) 0.05 to 10 parts of one or more antistatic agents selected from the group consisting of anionic, cationic, nonionic, nonionic-anionic, and amphoteric surfactants; all quantities in terms of parts and percentages being by weight wherein the rubber trunk polymer is dispersed in a resin matrix in a mutually bridged state, said resin matrix being a free copolymer formed from that portion of the monomer mixture which is not grafted onto the rubber trunk polymer, or a combination of ssid free copolymer and the nitrile random compolymer.

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**4,298,711**

## LOW SHRINK UNSATURATED POLYESTER RESINOUS COMPOSITION

**Thomas J. Moulson, and John E. Greenzweig, both of Minneapolis, Minn., assignors to Cargill Incorporated, Minneapolis, Minn.**

**Filed Apr. 9, 1980, Ser. No. 138,660**
**Int. Cl.³ C08L *67/00***
**U.S. Cl. 525—40** **7 Claims**

1. A low shrink polyester resin which is a product of

(a) mixing from about 25 to about 35 parts by weight of a member selected from the group consisting of maleic acid, fumaric acid, their anhydrides and mixtures thereof,

from about 5 to about 25 parts by weight of a member selected from the group consisting of isophthalic acid, phthalic acid, their anhydrides, and mixtures thereof,

from about 10 to about 40 parts by weight propylene glycol,

from about 10 to about 30 parts by weight dipropylene glycol,

from about 5 to about 30 parts by weight propylene glycol terephthalate,

(b) heating said mixture at about 420° F. until a neat resin is formed with an acid number of from about 5 to about 50; and

(c) diluting the neat resin with from about 25 to about 100 parts by weight of a member selected from the group consisting of styrene, vinyl toluene and mixtures thereof.

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**4,298,712**

## ADHESIVE BLENDS OF ELASTOMER, POLYOLEFIN, AND GRAFT OF POLYETHYLENE WITH UNSATURATED FUSED RING ANHYDRIDES

**John Machonis, Jr., Schaumburg; Seymour Schmukler; Robert J. Zeitlin, both of Palatine, and Mitsuzo Shida, Barrington, all of Ill., assignors to Chemplex Company, Rolling Meadows, Ill.**

**Continuation-in-part of Ser. No. 681,480, Apr. 29, 1976, abandoned. This application Aug. 1, 1977, Ser. No. 820,611**
**Int. Cl.³ C08F *255/02*; C08L *9/00, 23/04, 33/00***
**U.S. Cl. 525—74** **13 Claims**

1. A modified polyolefin blend having improved adhesion to various substrates and consisting essentially of:

(a) about 0.1–95 parts by weight in said blend of a graft copolymer of about 70–99.999 wt.% of a high density polyethylene backbone grafted with about 30–0.001 wt.% of at least one compound containing at least one member of the group consisting of x-methylbicyclo(2.2.1)hept-5-ene-2,3-dicarboxylic acid anhydride and bicyclo(2.2.1-)hept-5-ene-2,3-dicarboxylic acid anhydride blended with both

(b) at least one elastomer of the class consisting of homopolymers of isobutylene, copolymers of isobutylene, homopolymers of chloroprene, copolymers of a diene and a vinyl aromatic compound, block copolymers of a diene and a vinyl aromatic compound, copolymers of a hydrogenated diene and a vinyl aromatic compound, hydrogenated block copolymers of a diene and a vinyl aromatic compound, homopolymers of butadiene, and a copolymer of an ethylenically unsaturated nitrile and a diene, and

(c) at least one polyolefin resin of the class consisting of homopolymers of ethylene, copolymers of ethylene and an ethylenically unsaturated ester, and copolymers of ethylene and alpha-olefin.

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**4,298,713**

## PROCESS FOR PREPARING LOW DENSITY ETHYLENE COPOLYMERS

**Yoshinori Morita; Akinori Toyota, and Norio Kashiwa, all of Iwakuni, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan**

**Filed Dec. 26, 1979, Ser. No. 106,736**
**Claims priority, application Japan, Dec. 28, 1978, 53-161203**
**Int. Cl.³ C08F *2/06, 4/16***
**U.S. Cl. 525—323** **12 Claims**

7. The process of claim 1 or claim 5 wherein in the pretreatment step (i), the reaction temperature ranges from about −40° C. to about 80° C., and said alpha-olefin contains from 3 to 6 carbon atoms, and the amount of the crystalline poly(alpha-olefin) formed is in the range of from about 0.05 to about 20 grams, per gram of the titanium catalyst component (A).

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**4,298,714**

## MODIFIED POLYVINYLCHLORIDE

**Gideon Levin, and David Vofsi, both of Rehovot, Israel, assignors to Yeda Research & Development Co. Ltd., Rehovot, Israel**

**Filed Dec. 16, 1980, Ser. No. 217,144**
**Int. Cl.³ C08F *114/06***
**U.S. Cl. 525—330** **8 Claims**

1. A modified polyvinyl chloride wherein part of the chlorine atoms are substituted by groups of the formula

$$—S—CH_2—CH_2—R—(CH_2—CH_2—R)_n—Alk$$

wherein R, which may be identical or different, designates oxygen, sulfur, —NH— or a bond, wherein Alk designates alkyl of up to 14 carbon atoms, and wherein n is an integer of from 1 to 100 or zero.

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**4,298,715**

## POLYAMINE/EPIHALOHYDRIN REACTION PRODUCTS

**Donald N. Van Eenam, Des Peres, Mo., assignor to Monsanto Company, St. Louis, Mo.**

**Filed Mar. 1, 1978, Ser. No. 882,493**
**Int. Cl.³ C08F *8/18, 8/34, 8/40***
**U.S. Cl. 525—340** **3 Claims**

1. A process for the production of an acid stabilized resin solution which process comprises

(1) polymerizing an aqueous solution of a diallylamine hydrohalide salt having the formula $(CH_2{=}C\ (R){-}CH_2\ NHR'^{+}X^{-}$ wherein the R groups are the same or different and are selected from hydrogen and lower alkyl groups, R′ is selected from hydrogen, alkyl and substituted alkyl groups and $X^{-}$ is a halide ion, either alone or as a mixture with other copolymerizable monomers in the presence of a free radical catalyst to form a polymer in which from 5 to 100% of the recurring units are derived from the diallylamine;

(2) raising the pH of the solution sufficiently to convert at least part of the residual unpolymerized monomeric amine salt to free amine but not so high as to precipitate the polyamine from solution;

(3) separating the free amine monomer from the polyamine solution;

(4) reacting the polyamine with from about 0.5 to about 1.5

moles of an epihalohydrin per mole of amine present in said polymer at a temperature of about 30° to about 80° C. and a pH from about 7 to about 9.5 to form a water-soluble resinous reaction product containing epoxide groups; and

(5) reacting the resinous reaction product in aqueous solution, with from about 0.3 equivalents to about 1.2 equivalents per equivalent of epihalohydrin of a water-soluble acid selected from the group consisting of hydrogen halide acids, sulfuric acid, nitric acid, phosphoric acid, formic acid and acetic acid until the epoxide groups are converted substantially to the corresponding halohydrin groups and an acid-stabilized resin solution is obtained.

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**4,298,716**

## STYRENIC TETRAPOLYMER

**Daniel L. Dufour, Longmeadow, Mass., assignor to Monsanto Company, St. Louis, Mo.**

**Filed Apr. 3, 1980, Ser. No. 137,078**
**Int. Cl.[3] C08F *22/06***
**U.S. Cl. 526—65** **3 Claims**

**1.** A process for the production of a thermoformable composition which comprises sequentially:

A. forming a reaction mixture comprising styrene, α-methyl styrene, an ethylenically unsaturated nitrile and an ethylenically unsaturated dicarboxylic acid anhydride wherein the weight proportions of the components are such that:
(i) styrene + α-methyl styrene represents from 45–60%;
(ii) nitrile + anhydride represents from 40–55%;
(iii) α-methyl styrene represents from 10–50%; and
(iv) nitrile and anhydride each individually represent at least 10% of the monomers present in the reaction mixture;

B. initiating and continuing polymerization of the mixture in the absence of a dispersing medium till at least 40% conversion; and

C. substantially completing polymerization in aqueous suspension.

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**4,298,717**

## ETHYLENE POLYMERIZATION PROCESS

**Jean-Pierre Machon, Bethune, France, assignor to Societe Chimique des Charbonnages-CdF Chimie, Paris la Defense, France**

**Filed Aug. 1, 1978, Ser. No. 929,952**
**Claims priority, application France, Aug. 1, 1977, 77 23652**
**Int. Cl.[3] C08F *2/02, 2/06, 10/02***
**U.S. Cl. 526—124** **8 Claims**

**1.** A continuous process for polymerizing ethylene under a pressure of 600 to 2,000 bars and a temperature of 200° to 300° C., in at least one reactor comprising at least one reaction zone, by means of a catalytic system comprising (a) an activator selected from trialkylaluminums and alkylsiloxalanes, and (b) a compound comprising titanium trichloride, wherein a complexing agent (c) is injected into the reaction zone from a first supply source and said compound (b) is injected from a separate supply source whereby components (b) and (c) do not contact one another until substantially the time they are injected into the reaction zone but immediately contact one another at substantially the time of injection into the reaction zone and the concentration of complexing agent (c) in the reaction zone may be adjusted independently from the concentration of (b) in the same reaction zone, the ratio of the molar flow rate of (c) to the molar flow rate of titanium being between 0.15 and 4, said complexing agent being selected from silicone oils and from compounds having the formula $X(OR)_n$, wherein X is hydrogen or a metal, n is the valence of X, and R is an alkyl radical of up to 20 carbon atoms, the residence time of ethylene in the reaction zone being between 1 and 120 seconds.

**4,298,718**

## CATALYSTS FOR THE POLYMERIZATION OF OLEFINS

**Adolfo Mayr; Paolo Galli; Ermanno Susa; Giovanni Di Drusco, all of Ferrara, and Ettore Giachetti, Milan, all of Italy, assignors to Montecatini Edison S.p.A., Milan, Italy**

**Continuation of Ser. No. 324,596, Jan. 18, 1973, abandoned, which is a continuation of Ser. No. 878,954, Nov. 21, 1969, abandoned. This application Oct. 14, 1975, Ser. No. 622,550**
**Claims priority, application Italy, Nov. 25, 1968, 24141 A68**
**Int. Cl.[3] C08F *4/02, 10/02***
**U.S. Cl. 526—125** **56 Claims**

**1.** A catalyst-forming component for use in preparing catalysts for the polymerization of olefins and which is the product obtained by contacting a titanium tetrahalide with an anhydrous magnesium dihalide in an active form characterized in that, in its X-rays powder spectrum, the diffraction line which is most intense in the spectrum of the normal, non-active magnesium dihalide is less intense and, in its place, a halo appears.

**11.** Polymerization catalysts prepared by mixing

(a) a supported catalyst-forming component the essential support material of which is an active magnesium dihalide, said component being obtained by cogrinding a titanium tetrahalide with a normal, non-active anhydrous magnesium dihalide to obtain a component (a) the magnesium dihalide support material of which is activated and characterized in that it has one or both of the following properties (1) its X-rays powder spectrum does not show the most intense diffraction lines as they appear in the X-rays powder spectrum of normal, non-active magnesium dihalide, the spectrum of the activated magnesium dihalide showing a broadening of said most intense diffraction lines; (2) the surface area of the activated magnesium dihalide is greater than 3 $m^2/g$; with

(b) a hydride or organometallic compound of a metal belonging to one of Groups I to III inclusive of the Mendelyeev Periodic Table.

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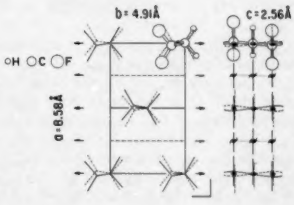
**4,298,719**

## DOUBLY ORIENTED FILM OF POLYVINYLIDENE FLUORIDE

**Toshiya Mizuno; Mitsuru Ohta, and Masahiro Segawa, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Jul. 19, 1979, Ser. No. 58,776**
**Claims priority, application Japan, Jul. 27, 1978, 53-90965**
**Int. Cl.[3] B32B *27/00;* B29C *17/02;* H01B *3/44;* C08F *14/18***
**U.S. Cl. 526—255** **5 Claims**




**1.** A biaxially stretched film of polyvinylidene fluoride having a crystal region which is predominantly occupied by doubly oriented form I crystals.

**4,298,720**

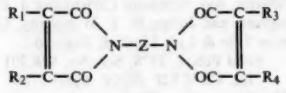
## THERMOSETTING RESIN COMPOSITION FROM MALEIMIDE COMPOUND AND ALKENYL PHENOL

**Noboru Yamazaki; Tsutomu Takase, both of Nagoya; Yoshio Morimoto, Tokai, and Teruo Yuasa, Nagoya, all of Japan, assignors to Mitsui Toatsu Chemicals Incorporated, Tokyo, Japan**

**Filed Jul. 23, 1979, Ser. No. 59,758**
**Int. Cl.³ C08F *22/40***
**U.S. Cl. 526—262** **7 Claims**

1. A thermosetting resin composition comprising:

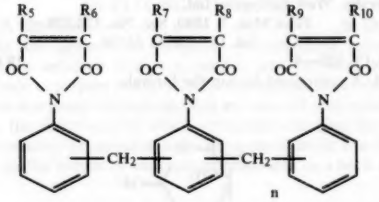
(a) at least one maleimide compound selected from the group consisting (i) bismaleimides having the formula



where $R_1$, $R_2$, $R_3$, and $R_4$ are the same or different from each other and are: hydrogen atoms; or halogen atoms; or straight-chain or branched alkyl radicals of from 1 to 10 carbon atoms; or phenyl radicals; or substituted phenyl radicals having one or more substituents selected from the straight-chain or branched alkyl radicals of from 1 to 10 carbon atoms, halogen atoms, $R_{13}O$—groups in which $R_{13}$ is an aliphatic radical of from 1 to 5 carbon atoms, and, when there are two or more radicals represented by $R_{13}$, said radicals are identical to or different from each other,

groups in which $R_{13}$ is as previously defined, hydroxyl groups, or cyano groups; and Z is a divalent organic radical of at least 2 carbon atoms; and

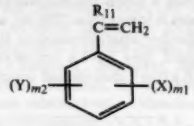
(ii) polymaleimides having the formula



where $R_5$, $R_6$, $R_7$, $R_8$, $R_9$, and $R_{10}$ are the same or different from each other and are hydrogen atoms; or halogen atoms; or straight-chain or branched alkyl radicals of from 1 to 10 carbon atoms; or phenyl radicals; or substituted phenyl radicals having one or more substituents selected from halogen atoms, straight-chain or branched alkyl radical of from 1 to 10 carbon atoms, $R_{13}O$—groups in which $R_{13}$ is as previously defined,

groups in which $R_{13}$ is as previously defined, hydroxyl group, or cyano groups; and n is zero or a positive number; and

(b) at least one alkenylphenol derivative selected from the groups consisting of compounds having the formula



where $R_{11}$ is a hydrogen atom; or halogen atom; or straight-chain or branched alkyl radical of from 1 to 10 carbon atoms; or phenyl radical; or substituted phenyl radical having one or more substituents selected from halogen atoms, straight-chain or branched alkyl radicals of from 1 to 10 carbon atoms, $R_{13}O$—groups in which $R_{13}$ is as previously defined,

groups in which $R_{13}$ is as previously defined, hydroxyl groups, or cyano groups; X is a hydrogen atom; or a halogen atom; or a carboxyl group; or an

group in which $R_{13}$ is as previously defined; or a $R_{13}O$—group in which $R_{13}$ is as previously defined; or a cyano group; Y is a hydroxyl group; or a $R_{13}O$—group in which $R_{13}$ is as previously defined; or a glycidyloxy group; or an aryloxy group; or a substituted aryloxy group having one or more substituents selected from halogen atoms or straight-chain or branched alkyl radicals of from 1 to 5 carbon atoms; or a propargyloxy group; or a substituted propargyloxy group having one or more substituents selected from halogen atoms or straight-chain or branched alkyl radicals of from 1 to 5 carbon atoms; or an

group in which $R_{14}$ is an aliphatic radical of from 1 to 20 carbon atoms; or an aromatic radical; and $m_1$ and $m_2$ are positive integers and the sum of $m_1+m_2$ has the value of 5.

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**4,298,721**

## THERMOPLASTIC RUBBERS AND PROCESS FOR PREPARING SAME

**Italo Borghi; Sergio Foschi, and Paolo Galli, all of Ferrara, Italy, assignors to Montedison S.p.A., Milan, Italy**

**Continuation of Ser. No. 807,520, Jun. 17, 1977, abandoned, which is a continuation of Ser. No. 550,136, Feb. 14, 1975, abandoned. This application Mar. 1, 1979, Ser. No. 16,558**
**Claims priority, application Italy, Feb. 15, 1974, 41005 A/74**
**Int. Cl.³ C08F *10/06***
**U.S. Cl. 526—348** **5 Claims**

1. Unvulcanized copolymers of propylene with ethylene containing from 50% to 75% by weight of polymerized propylene, said copolymers being obtained by polymerizing mixtures of ethylene and propylene to copolymers showing, on X-rays examination in the unoriented state, crystallinity of polypropylene and/or of polyethylene type, the crystallinity content ranging from 3 to 50% and the polyethylene-type crystallinity being less than 20%, said copolymers being further characterized in that the insoluble residue of the extraction of the total polymerizate with xylene at room temperature is from 40% to 75% by weight of the total polymerizate and in that in the infrared spectrum thereof the value of the R ratio between the absorption intensity of the band at 11.88 microns and that of

the absorption intensity at 12.16 microns is from 2 to 6, the R ratio being less than 4 when the polymerized propylene content of the polymers is lower than 70% by weight, said copolymers being still further characterized in that, after compression-molding thereof, they have a tensile strength at break of from 102 to 220 $Kg/cm^2$, determined according to ASTM D 412.

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**4,298,722**

**FRACTIONABLE, ELASTOMERIC POLY (1-BUTENE)**

**John W. Collette, Wilmington, Del., and Charles W. Tullock, Landenberg, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**PCT No. PCT/US80/00014, § 371 Date Mar. 11, 1980, § 102(e) Date Mar. 11, 1980**

**PCT Filed Jan. 10, 1980, Ser. No. 129,476**

**Int. Cl.³ C08F** *10/08, 10/14*

**U.S. Cl. 526—348.6** **8 Claims**

**1**. A fractionable, elastomeric, whole-polymer poly(1-butene) consisting essentially of

(i) 30% to 80%, by weight, of an ether-soluble fraction having an intrinsic viscosity exceeding 1.5 and an infrared crystallinity value of about 1% to 15%; and

(ii) 20% to 70%, by weight, of an ether-insoluble fraction having an infrared crystallinity value of about 20% to 55%;

said polymer further characterized by

(a) intrinsic viscosity exceeding 1.5,

(b) nmr isotacticity of 20% to 50%,

(c) tensile set not exceeding 150%, and

(d) tensile stress, $M_{100}$, above 10.

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**4,298,723**

**LAYERED OR AMORPHOUS ACYCLIC ORGANOMETALLIC INORGANIC POLYMERS**

**Peter M. DiGiacomo, Mission Viejo, and Martin B. Dines, Santa Ana, both of Calif., assignors to Occidental Research Corporation, Irvine, Calif.**

**Continuation-in-part of Ser. No. 945,971, Sep. 26, 1978, Pat. No. 4,232,146, and Ser. No. 60,079, Jul. 24, 1979. This application Sep. 25, 1979, Ser. No. 78,625**

**Int. Cl.³ C08G** *79/00, 79/04*

**U.S. Cl. 528—271** **28 Claims**

**1**. A solid polymeric compound having basic structural units of the formula:

$$M(O_3ZO_xR)_n$$

in which M is one or more tetravalent metals, Z is a pentavalent atom selected from the group consisting of phosphorus, arsenic, antimony, vanadium, niobium and tantalum, R is an organo group selected from acyclic and heteroacyclic groups, x is 0 or 1, and n is 2, provided that n is 1 when R is terminated with a tri- or tetra-oxy pentavalent atom.

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**4,298,724**

**BRANCHED POLYESTERS FOR ADHESIVES AND COATING COMPOSITIONS**

**Eugene G. Sommerfeld, Penn Valley, and Paul R. Noyes, Philadelphia, both of Pa., assignors to E. I. DuPont de Nemours and Company, Wilmington, Del.**

**Filed Feb. 20, 1980, Ser. No. 123,069**

**Int. Cl.³ C08G** *63/18*

**U.S. Cl. 528—302** **10 Claims**

**1**. A hydroxyl-containing polyester, soluble to the extent of at least 65% by weight in methyl ethyl ketone, formed from at least four different organic moieties:

(1) at least one diol moiety having 2–14 carbons;

(2) at least one triol or higher polyol moiety having 3–14 carbons;

(3) at least one dibasic aromatic acid moiety; and

(4) at least one dibasic aliphatic acid moiety,

the mole ratio $X_1$ of total polyol to total polyacid being in the range 1.25/1 to 1.8/1,

the mole ratio $X_2$ of diol to higher polyol being in the range of 0.8/1 to 1.5/1, and

the mole ratio $X_3$ of aromatic acid to total acid being in the range 0.3/1 to 0.8/1,

not all of $X_1$, $X_2$ and $X_3$ being at their extremes simultaneously.

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**4,298,725**

**PROCESS FOR THE PREPARATION OF POLYSACCHARIDE 9**

**Alan G. Williams, Ayr, Scotland; Christopher J. Lawson, Berkshire, England, and Julian W. T. Wimpenny, Gwent, Wales, assignors to Tate & Lyle Limited, England**

**Filed Feb. 1, 1978, Ser. No. 874,201**

**Int. Cl.³ C12P** *19/04;* **A23G** *3/00*

**U.S. Cl. 536—1** **15 Claims**

**1**. A process for the preparation of a polysaccharide which comprises cultivating Pseudomonas sp NCIB 11264 (ATCC 31260) to yield an exocellular polysaccharide.

**15**. A polysaccharide produced by Pseudomonas sp. NCIB 11264 characterized by an optical rotation $[\alpha]_{22}$ of $-15°$ C. (c $0.68_{H2O}$), an apparent viscosity of 4,600 cps measured at 25° C. for a one percent by weight solution, and a repeating unit which has one side chain terminated by a 4,6-O-(1-carboxyethylidene)-D-glucose and one 4,6 disubstituted glucose branch point, wherein the repeating unit comprises an acetate, a pyruvate, a 3-substituted-D-galactose, and 7 glucoses comprising a 6-substituted glucose, two 4-substituted glucoses, two 3-substituted glucoses and two 4,6-disubstituted glucoses, one of which is said branch point.

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**4,298,726**

**SYNTHESIS OF N-BENZOYL-L-RISTOSAMINE AND INTERMEDIATES USED IN ITS PREPARATION**

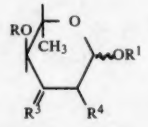
**Roy L. Whistler, West Lafayette, Ind., assignor to Purdue University, West Lafayette, Ind.**

**Filed Mar. 7, 1980, Ser. No. 128,298**

**Int. Cl.³ C07H** *15/04*

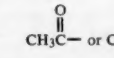
**U.S. Cl. 536—4** **19 Claims**

**15**. A compound having the formula



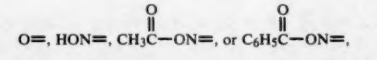
wherein

R is



$R^1$ is $C_1$–$C_6$ alkyl

$R^3$ is



$R^4$ is HgCl or H provided that when $R^4$ is HgCl, $R^3$ must be O= or HON=; when $R^4$ is H, $R^3$ cannot be O=.

**4,298,727**

## 3′,4′-DIDEOXYKANAMYCIN A AND 1-N-(S)-α-HYDROXY-ω-AMINOALKANOYL) DERIVATIVES THEREOF

**Hamao Umezawa; Sumio Umezawa, both of Tokyo; Tsutomu Tsuchiya, Yokohama; Tomo Jikahara, and Toshiaki Miyake, both of Kawasaki, all of Japan, assignors to Zaidan Hojin Biseibutsu Kagaku KenkyuKai, Tokyo, Japan**

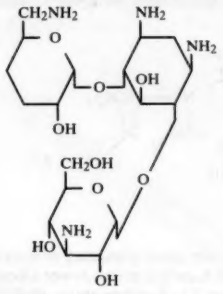
**Filed Jan. 23, 1980, Ser. No. 114,779**

**Claims priority, application Japan, Feb. 5, 1979, 54-11402**

**Int. Cl.³ C07H** *15/22*

**U.S. Cl. 536—10** **6 Claims**

**1.** A compound which is 3′,4′-dideoxykanamycin A of the formula



(Ia)

or a pharmaceutically acceptable acid-addition salt thereof.

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**4,298,728**

## METHOD OF PREPARING HYDROXYETHYL ETHERS OF CELLULOSE

**Thomas G. Majewicz, Chadds Ford, Pa., and Walter S. Ropp, Hockessin, Del., assignors to Hercules Incorporated, Wilmington, Del.**

**Filed Jun. 3, 1980, Ser. No. 155,919**

**Int. Cl.³ C08G** *59/00, 65/08*

**U.S. Cl. 536—96** **10 Claims**

**1.** In the process for preparing hydroxyethyl cellulose wherein a cellulose furnish is reacted with an alkali metal hydroxide to prepare alkali cellulose and said alkali cellulose is slurried in a lower aliphatic alcohol and reacted with ethylene oxide, the improvement which comprises carrying out the alkali cellulose preparation in the presence of about 1 to 30%, based on the weight of cellulose of boric acid or a boric acid salt.

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**4,298,729**

## XANTHAN GUM-MODIFIED STARCHES

**Hsiung Cheng, and Peter Wintersdorff, both of San Diego, Calif., assignors to Merck & Co., Inc., Rahway, N.J.**

**Filed May 25, 1979, Ser. No. 42,663**

**Int. Cl.³ A23L** *1/195, 1/189;* **C08L** *3/04*

**U.S. Cl. 536—102** **1 Claim**

**1.** A process for preparing xanthan gum-modified starch comprising

a. preparing an aqueous mixture of xanthan gum and precursor starch, where the xanthan gum to precursor starch ratio ranges from 1:100 to 1:1,

b. heating said mixture below 100° C. to effect gelatinization of the precursor starch where the heating is continued until the moisture content of the mixture is below 10%, and then

c. drying said heated mixture between 138°–176° C. for at least fifteen seconds in an oven or extruder.

**4,298,730**

## PROCESS FOR THE PRODUCTION OF A SURFACTANT CONTAINING SUCROSE ESTERS

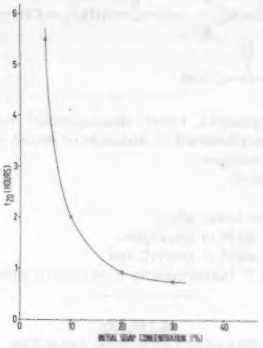
**Harry R. Galleymore, Bath; Kenneth James, Reading; Haydn F. Jones, Reading; Chaman L. Bhardwaj, Reading, all of England; James S. Plant, deceased, late of Reading, England, and by Aline P. Plant, administrator, Manchester, England, assignors to Talres Development (N.A.) N.V., Curacao, Netherlands Antilles**

**Filed Jul. 31, 1980, Ser. No. 174,277**

**Claims priority, application United Kingdom, Dec. 19, 1979, 43762/79; May 1, 1980, 14370/80**

**Int. Cl.³ C07H** *13/06;* **C11D** *1/66, 9/26, 11/04*

**U.S. Cl. 536—119** **20 Claims**



**1.** In the process for the preparation of a surfactant mixture containing sucrose mono- and di-esters, by reacting a starting mixture including solid particulate sucrose, at least one triglyceride of a fatty acid having at least 8 carbon atoms and a basic transesterification catalyst, at a temperature of from 110° to 140° C. at atmospheric pressure and in the absence of any solvent, the improvement which comprises that the starting mixture:

(a) contains a di- and/or mono-glyceride in an amount to provide a hydroxyl value of greater than 500 mg KOH/100 g of starting mixture;

(b) contains at least 10% by weight of a fatty acid soap in addition to the basic transesterification catalyst, at least 50% by weight of the soap being potassium soap, and

(c) (when the soap content is less than 20% by weight) contains at least 25% by weight of sucrose.

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**4,298,731**

## BENZOTHIADIAZINE COMPOUNDS

**Gerhard Hamprecht, Mannheim; Gerd Stubenrauch, Ludwigshafen; Hans Urbach, Lampertheim, and Bruno Wuerzer, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany**

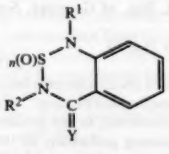
**Filed Nov. 16, 1977, Ser. No. 851,826**

**Claims priority, application Fed. Rep. of Germany, Dec. 11, 1976, 2656290**

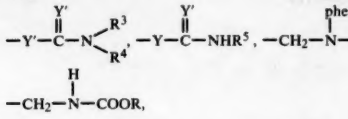
**Int. Cl.³ C07D** *285/16*

**U.S. Cl. 544—11** **8 Claims**

**1.** A compound of the formula



where $R^1$ is lower alkynyl; lower haloalkenyl; lower haloalkynyl; lower alkoxycarboalkyl; lower alkoxycarboalkenyl; lower alkanoylalkyl; lower azidoalkyl; lower thiocyanatoalkyl; lower cyanoalkyl; carbamyl-lower alkyl; carbamyl-lower alkyl substituted by halogen; halo- or methyl substituted phenyl; lower alkylmercaptoalkyl, lower phenylmercaptoalkyl, wherein in said alkylmercaptoalkyl and phenylmercaptoalkyl the final alkyl has more than 1 carbon atom; or methyl substituted by lower O-alkyl-N-alkylaminophosphorothio, lower O,O-dialkylphosphoro, lower O,O,O-trialkylphosphinylimino, lower alkoxy thiocarbonyl thio, lower alkylsulfinyl, thiocarbamido, isothiuronium hydrochloride,



lower alkanoylamido, lower alkanoylamido substituted by halogen, phthalylimidoalkyl, isoxazole or isoxazole substituted by methyl or halogen;

$R^2$ is isopropyl;

n is 2;

R and $R^3$ are lower alkyl,

$R^4$ is lower alkyl or hydrogen,

$R^5$ is lower alkyl or phenyl; and

each Y and Y' independently is oxygen or sulfur.

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**4,298,732**

**CRYSTALLIZATION PROCESS**

**Harry C. Stables, Ulverston, England, assignor to Glaxo Group Limited, England**

**Continuation of Ser. No. 4,071, Jan. 17, 1978, abandoned. This application Mar. 3, 1980, Ser. No. 126,523**

**Claims priority, application United Kingdom, Jan. 17, 1978, 1881/78**

**Int. Cl.³ C07D *501/12***

**U.S. Cl. 544—20** **11 Claims**

1. In a process for the preparation of crystalline sodium cefuroxime wherein the improvement comprises the steps of adding an aqueous solution containing from 5 to 20% w/v of sodium cefuroxime and an aqueous solution containing sodium ions derived from a non-toxic, water-soluble sodium salt of an organic carboxylic acid other than those derived from sodium cefuroxime, and having a concentration of from 20 to 70% w/v; to an aqueous crystallising medium containing a seeding amount of solid sodium cefuroxime and recovering crystalline sodium cefuroxime from the crystallising medium, the crystallising medium being at a temperature of from 20° to 60° C. and the aqueous solution of sodium cefuroxime and the aqueous solution containing sodium ions being added substantially simultaneously and at substantially the same volume rate, whereby sodium cefuroxime continuously crystallises out of the crystallising medium as the two solutions are added.

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**4,298,733**

**PREPARATION OF CIS-2,6-DIMETHYLMORPHOLINE**

**Norbert Goetz, Worms; Walter Himmele, Walldorf, and Leopold Hupfer, Friedelsheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany**

**Filed Sep. 8, 1980, Ser. No. 184,816**

**Claims priority, application Fed. Rep. of Germany, Sep. 25, 1979, 2938698**

**Int. Cl.³ C07D *265/30***

**U.S. Cl. 544—106** **2 Claims**

1. A process for the preparation of cis-2,6-dimethylmorpholine by isomerizing trans-2,6-dimethylmorpholine, wherein trans-2,6-dimethylmorpholine is converted, in the presence of hydrogen and of a catalyst containing palladium as well as zinc, cadmium or manganese or a mixture of these, at from 120° to 280° C., especially from 150° to 250° C. under a pressure of from 1 to 200 bar.

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**4,298,734**

**DIAZAHETEROCYCLOPURINES AND TRIAZOLOPYRIMIDINES**

**Davis L. Temple, Jr., Evansville, Ind., assignor to Mead Johnson & Company, Evansville, Ind.**

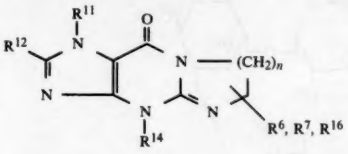
**Continuation-in-part of Ser. No. 869,203, Jan. 13, 1978, abandoned, which is a continuation-in-part of Ser. No. 768,291, Feb. 14, 1977, abandoned. This application Mar. 5, 1979, Ser. No. 17,771**

**Int. Cl.³ C07D *487/12, 487/14***

**U.S. Cl. 544—251** **32 Claims**

1. A compound selected from the group consisting of

Formula XX



wherein

Q is O, S, or $NR^{10}$,

$R^{10}$ is selected from the group consisting of hydrogen, lower alkyl having up to 8 carbon atoms, lower alkenyl or lower alkynyl each having 3 to 8 carbon atoms, dialkylaminoalkyl having 4 to 12 carbon atoms, cycloalkyl having 3 to 6 carbon atoms, cycloalkylalkyl having 4 to 12 carbon atoms, pyridylmethyl, aralkyl or substituted aralkyl each having 7 to 12 carbon atoms, aryloxyalkyl or substituted aryloxyalkyl each having 8 to 12 carbon atoms wherein each of said substituted aralkyl and substituted aryloxyalkyl groups contains 1 or 2 substituents selected from halogen, alkoxy, and alkyl, and each of said alkoxy and alkyl groups contains up to 6 carbon atoms,

$R^{11}$ is alkoxycarbonyl having 2 to 4 carbon atoms, aminoalkyl having 2 to 8 carbon atoms, or is independently selected from the foregoing group defined for $R^{10}$,

$R^{12}$ is lower alkyl, lower alkenyl, lower alkynyl, lower alkylthio, lower alkylsulfinyl, or lower alkylsulfonyl each having up to 8 carbon atoms, hydrogen, thioxo, trifluoromethyl or halogen when $R^{11}$ is hydrogen,

$R^{12}$ is lower alkylamino, di-lower alkylamino, lower alkoxyimino, lower alkyl, lower alkenyl, lower alkynyl, lower alkylthio, lower alkylsulfinyl, lower alkylsulfonyl, or lower alkoxy each having up to 8 carbon atoms, hydrogen, thioxo, trifluoromethyl, halogen, hydrazino, azido, cyano, hydroxy, or amino when $R^{11}$ is other than hydrogen,

$R^{14}$ is selected from the group consisting of lower alkyl having up to 8 carbon atoms, lower alkenyl or lower alkynyl having 3 to 8 atoms, cycloalkyl having 3 to 6 carbon atoms, cycloalkylalkyl having 4 to 12 carbon atoms, pyridylmethyl, lower alkanoyl or lower alkenoyl or lower alkynoyl each having up to 8 carbon atoms, aroyl or substituted aroyl having 7 to 12 carbon atoms, aralkyl or substituted aralkyl having 7 to 12 carbon atoms, aryloxyalkyl or substituted aryloxyalkyl having 8 to 12 carbon atoms wherein each of said substituted aroyl, substituted aralkyl, and substituted aryloxyalkyl groups contains 1 or 2 ring substituents selected from halogen, alkoxy, and alkyl, and each of said alkoxy and alkyl groups contains up to 6 carbon atoms,

$R^6$ and $R^7$ are attached to ring carbon atoms and are selected from hydrogen, methyl, and ethyl,

$R^{16}$ represents hydrogen or a double bond between adjacent ring carbon atoms,

n is the integer 1, 2 or 3,

the pharmaceutically acceptable acid addition and quaternary ammonium salts of the foregoing compounds, and the pharma-

ceutically acceptable metal, ammonium, and amine salts of the foregoing compounds wherein $R^{11}$ is hydrogen.

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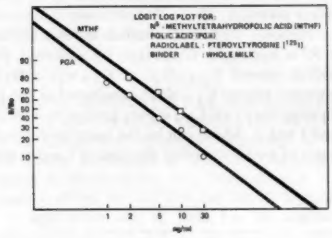
**4,298,735**

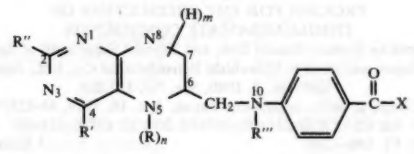
## FOLIC ACID DERIVATIVES

**Peter R. Farina, North Salem, and James A. Grattan, Croton-on-Hudson, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.**

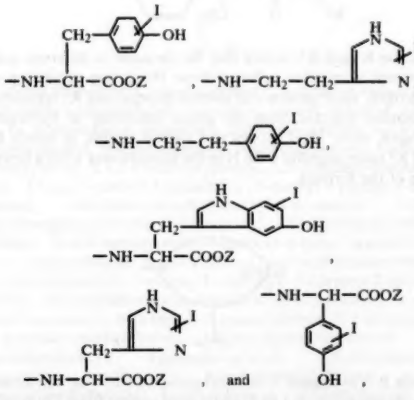
**Filed Apr. 30, 1979, Ser. No. 34,760**
**Int. Cl.³ C07D *475/04***
**U.S. Cl. 544—257** **16 Claims**




**1**. A radioiodinated composition having the formula:



wherein R represents hydrogen, lower alkyl, formyl or iminomethyl R′ and R″ individually represent lower alkyl, hydroxyl, halo, amino or acetamido, R‴ represents R or nitroso; X is a radioiodinated amino acid or radioiodinated des-carboxy amino acid moiety selected from the group consisting of:



wherein Z is hydrogen or lower alkyl; m has a value of 1, 3 or 4 and n has a value of zero or 1.

**4,298,736**

## CARBON-CAFFEINE SEPARATION

**Saul N. Katz, Monsey, and George E. Proscia, West Sayville, both of N.Y., assignors to General Foods Corporation, White Plains, N.Y.**

**Filed Jun. 16, 1980, Ser. No. 159,724**
**Int. Cl.³ C07D *473/12***
**U.S. Cl. 544—274** **12 Claims**

**1**. A process for recovering caffeine from activated carbon comprising:

contacting activated carbon having caffeine adsorbed thereon with a liquid, food-grade caffeine solvent which comprises an organic acid or an alcohol, and which is capable of displacing at least a portion of the caffeine from active sites on the carbon;

maintaining the contact for a period of time and at a temperature effective for the solvent to displace at least a portion of the caffeine from the carbon and dissolve the displaced caffeine; and

separating caffeine from the solvent.

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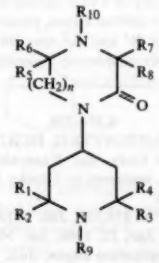
**4,298,737**

## PIPERDINYL SUBSTITUTED 1,4-DIAZA-2-CYCLOALKANONES AND DERIVATIVES THEREOF

**John T. Lai, Broadview Heights, and Pyong-Nae Son, Akron, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio**

**Division of Ser. No. 972,834, Dec. 26, 1978, abandoned. This application Oct. 22, 1979, Ser. No. 87,264**
**Int. Cl.³ C07D *241/04***
**U.S. Cl. 544—360** **6 Claims**

**1**. Compounds of the formula:



wherein $R_1$ through $R_4$ can be hydrogen or alkyl of 1 to 10 carbon atoms;

$R_5$ and $R_6$ are independently selected from the group consisting of alkyl of 1 to 12 carbon atoms, cycloalkyl, hydroxycycloalkyl, aminoalkyl, iminoalkyl, alkenyl, aralkyl and alkylene, provided further that any two of said substituents pendant from the same carbon atom can collectively form a cyclic or alicyclic hydrocarbon;

$R_7$ and $R_8$ are selected from the same group of substituents as $R_5$ and $R_6$ above;

$R_9$ and $R_{10}$ is oxygen, hydrogen or alkyl of 1 to 12 carbon atoms; and

n is 1 to 3.

## 4,298,738
## ACYLPHOSPHINE OXIDE COMPOUNDS THEIR PREPARATION AND USE

**Peter Lechtken, Frankenthal; Ingolf Buethe, Ludwigshafen; Manfred Jacobi, Frankenthal, and Werner Trimborn, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany**

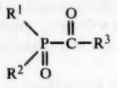
**Continuation of Ser. No. 55,399, Jul. 6, 1979, abandoned. This application May 12, 1980, Ser. No. 148,665**

**Claims priority, application Fed. Rep. of Germany, Mar. 14, 1979, 2909994**

**Int. Cl.**[3] **C07F** *9/53*

**U.S. Cl. 546—22** **5 Claims**

**1**. An acylphosphine oxide compound of the formula



(I)

where

$R^1$ is straight-chain or branched alkyl of 1 to 6 carbon atoms cyclohexyl, cyclopentyl, phenyl or naphthyl which is unsubstituted or substituted by halogen, alkyl of 1 to 6 carbon atoms or alkoxy of 1 to 6 carbon atoms, or a fully aromatic S-containing or N-containing five-membered or six-membered heterocyclic radical having one hetero atom, selected from pyridyl or thienyl,

$R^3$ is an at least disubstituted phenyl, pyridyl, furyl or thienyl radical which carries, at least at the two carbon atoms adjacent to the linkage point of the carbonyl group, the substituents A and B, which may be identical or different, and each of which is alkyl, alkoxy or alkylthio of 1 to 6 carbon atoms, cycloalkyl of 5 to 7 carbon atoms, phenyl or halogen, or $R^3$ is $\alpha$-naphthyl substituted by A and B at least in the 2- and 8-positions or is $\beta$-naphthyl substituted by A and B at least in the 1- and 3-positions and

$R^2$ has one of the meanings of $R^1$ (but $R^1$ and $R^2$ may be identical or different with the proviso that $R^1$ and $R^2$ do not stand simultaneously for alkyl of 1 to 5 carbon atoms or alkoxy of 1 to 5 carbon atoms if $R^3$ is phenyl which carries the substituents A and B, in the same positions as defined above, but in which the meanings of A and B are restricted to alkoxy of 1 to 5 carbon atoms or halogen) or is alkoxy of 1 to 6 carbon atoms, phenoxy, methylphenoxy or benzyloxy, or $R^1$ and $R^2$ may be joined together to form a five- or six-membered P-containing ring.

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## 4,298,739
## NOVEL CARBOSTYRIL DERIVATIVES

**Takao Nishi; Hiraki Ueda, and Kazuyuki Nakagawa, all of Tokushima, Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Tokyo, Japan**

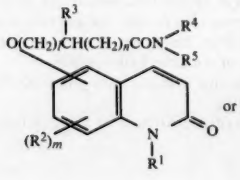
**Continuation of Ser. No. 914,589, Jun. 9, 1978, abandoned. This application Apr. 21, 1980, Ser. No. 142,057**

**Claims priority, application Japan, Jun. 10, 1977, 52/69319; Jun. 24, 1977, 52/75863; Feb. 28, 1978, 53/23012**

**Int. Cl.**[3] **C07D** *215/22;* **A61K** *31/47*

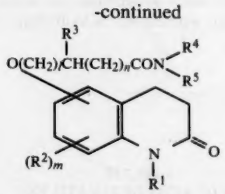
**U.S. Cl. 546—158** **35 Claims**

**1**. A compound of the formula,



(I)

-continued



(2)

wherein $R^1$ is hydrogen, $C_{1-4}$ alkyl, $C_{2-4}$ alkenyl or phenyl $C_{1-4}$ alkyl; $R^2$ is hydrogen, halogen, hydroxy or phenyl $C_{1-4}$ alkoxy; $R^3$ is hydrogen, hydroxy or $C_{1-4}$ alkyl; $R^4$ is phenyl, $C_{3-8}$ cycloalkyl, $C_{3-8}$ cycloalkyl $C_{1-4}$ alkyl or 2-(3,4-dimethoxyphenyl)ethyl or phenyl or $C_{3-8}$ cycloalkyl substituted by no more than two groups selected from $C_{1-4}$ alkyl, $C_{1-4}$ alkoxy, halogen, $C_{1-4}$ alkanoylamino, $C_{1-4}$ alkanoyloxy, $C_{1-4}$ alkoxycarbonyl, $C_{1-4}$ alkanoyl, $C_{1-4}$ alkylcarbamoyl, $C_{1-4}$ alkylamine, nitro, carboxy, hydroxyl, amninosulfonyl, carbamoyl, and amino; $R^5$ is hydrogen, $C_{1-8}$ alkyl, $C_{2-4}$ alkenyl, phenyl, $C_{3-8}$ cycloalkyl, phenyl $C_{1-4}$ alkyl or $C_{3-8}$ cycloalkyl $C_{1-4}$ alkyl or sustituted phenyl $C_{1-4}$ alkyl substituted in the phenyl group by no more than two $C_{1-4}$ alkoxy groups; m is an integer of 1 to 3; and l and n, which can be the same or different, are 0 or an integer of 1 to 7 such that the sum of l and n does not exceed 7.

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## 4,298,740
## PROCESS FOR THE PRODUCTION OF THIOLCARBAMATE COMPOUNDS

**Kazuhiko Konno; Atsushi Goh, and Kiyoshi Sugaya, all of Ami, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Japan**

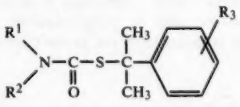
**Filed Apr. 3, 1980, Ser. No. 137,005**

**Claims priority, application Japan, Apr. 10, 1979, 54-42576**

**Int. Cl.**[3] **C07D** *211/06, 207/24, 209/32;* **C07C** *155/02*

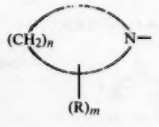
**U.S. Cl. 546—226** **7 Claims**

**1**. A process for the production of a thiolcarbamate compound of the formula

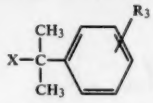


(I)

wherein $R^1$ and $R^2$, which may be the same or different, each represent a member selected from the group consisting of hydrogen, alkyl groups and alkenyl groups, and $R^3$ represents a member selected from the group consisting of hydrogen, halogen, nitro, alkyl groups and alkoxy groups, in which $R^1$ and $R^2$ taken together with N in the formula may form a hetero ring of the formula

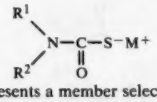


where R is hydrogen or an alkyl group of 1 to 4 carbon atoms, m is an integer from 1 to 2, and n is an integer from 2 to 6, said process comprising reacting a tertiary halogen compound of the formula



(II)

wherein X represents halogen, and $R^3$ is as defined above, with a thiolcarbamic acid salt of the formula



(III)

wherein M represents a member selected from the group consisting of the alkali metals, ammonium group and immonium group, in an aqueous reaction medium, in the presence of a strong base; wherein the reaction is carried out under conditions in which the reaction system is adjusted to a pH ranging from about 9 to about 13.

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**4,298,741**

## 6-AMIDO-3-SUBSTITUTED-1-AZABICYCLO[3.2.0]-HEPT-2-EN-7-ONE-2-CARBOXYLIC ACID

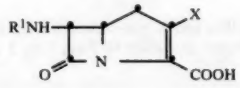
**Burton G. Christensen, Metuchen; Ravindra N. Guthikonda, Perth Amboy, and Ronald W. Ratcliffe, Matawan, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.**

**Continuation of Ser. No. 927,319, Jul. 24, 1978, abandoned. This application Jul. 11, 1980, Ser. No. 168,947**

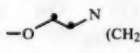
**Int. Cl.**[3] **C07D** *487/04, 205/08;* **A61K** *31/40;* **C07D** *409/12*

**U.S. Cl. 546—272** **2 Claims**

1. The compound of the formula:



or pharmaceutically acceptable salts thereof; wherein X is chloro, acetyl, methoxy,



or oxo, with the proviso that when X is oxo, 2–3 bond is saturated; and $R^1$ is

wherein R" is benzyl, p-hydroxybenzyl, 4-amino-4-carboxybutyl, methyl, cyanomethyl, 2-pentenyl, n-amyl, n-heptyl, ethyl, 3- or 4-nitrobenzyl, phenethyl, β,β-diphenylethyl, methyldiphenylmethyl, triphenylmethyl, 2-methoxyphenyl, 2,6-dimethoxyphenyl, 2,4,6-trimethoxyphenyl, 3,5-dimethyl-4-isoxazolyl, 3-butyl-5-methyl-4-isoxazolyl, 5-methyl-3-phenyl-4-isoxazolyl, 3-(2-chlorophenyl)-5-methyl-4-isoxazolyl, 3-(2,6-dichlorophenyl)5-methyl-4-isoxazolyl, D-4-amino-4-carboxybutyl, D-4-N-benzoylamino-4-carboxy-n-butyl, p-aminobenzyl, o-aminobenzyl, m-aminobenzyl, p-dimethylaminobenzyl, (3-pyridyl)methyl, 2-ethoxy-1-naphthyl, 3-carboxy-2-quinoxalinyl, 3-(2,6-dichlorophenyl)-5-(2-furyl)-4-isoxazolyl, 3-phenyl-4-isoxazolyl, 5-methyl-3-(4-guanidinophenyl)-4-isoxazolyl, 4-guanidinomethylphenyl, 4-guanidinomethylbenzyl, 4-guanidinobenzyl, 4-guanidinophenyl, 2,6-dimethoxy-4-guanidino, o-sulfobenzyl, p-carboxymethylbenzyl, p-carbamoylmethylbenzyl, m-fluorobenzyl, m-bromobenzyl, p-chlorobenzyl, p-methoxybenzyl, 1-naphthylmethyl, 3-isothiazolylmethyl, 4-isothiazolylmethyl, 5-isothiazolylmethyl, guanylthiomethyl, 4-pyridylmethyl, 5-isoxazolylmethyl, 4-methoxy-5-isoxazolylmethyl, 4-methyl-5-isoxazolylmethyl, 1-imidazolylmethyl, 2-benzofuranylmethyl, 2-indolylmethyl, 2-phenylvinyl, 2-phenylethynyl, 1-aminocyclohexyl, 2- and 3-thienylaminomethyl, 2-(5-nitrofuranyl)vinyl, phenyl, o-methoxyphenyl, o-chlorophenyl, 1-phenylphenyl, p-aminomethylbenzyl, 1-(5-cyanotriazolyl)methyl, difluoromethyl, dichloromethyl, dibromomethyl, 1-(3-methylimidazolyl)methyl, 2- or 3-(5-carboxymethylthienyl)-methyl, 2- or 3-(4-carbamoylthienyl)methyl, 2- or 3-(5-methylthienyl)methyl, 2- or 3-(methoxythienyl)methyl, 2- or 3-(4-chlorothienyl)methyl, 2- or 3-(5-sulfothienyl)methyl, 2- or 3-(5-carboxythienyl)methyl, 3-(1,2,5-thiadiazolyl)methyl, 3-(4-methoxy-1,2,5-thiadiazolyl)methyl, 2-furylmethyl, 2-(5-nitrofuryl)methyl, 3-furylmethyl, 2-thienylmethyl, 3-thienylmethyl, tetrazolylmethyl benzamidinomethyl and cyclohexylamidinomethyl.

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**4,298,742**

## ESTERS OF BENZOXA(THIA)ZOLE-2-CARBOXYLIC ACIDS

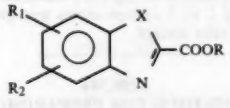
**Richard E. Brown, East Hanover, N.J.; Vasil St. Georgiev, New Rochelle, and Bernard Loev, Scarsdale, both of N.Y., assignors to USV Pharmaceutical Corporation, Tuckahoe, N.Y.**

**Filed May 12, 1980, Ser. No. 149,079**

**Int. Cl.**[3] **A61K** *31/42, 31/425;* **C07D** *263/34, 277/68*

**U.S. Cl. 548—152** **14 Claims**

1. An antiallergic compound of the formula:

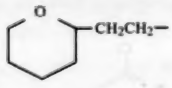


wherein,

X is S or O,

$R_1$ and $R_2$ are each hydrogen, $R_3$, $OR_4$, halogen, cyano, $COOR_4$, methanesulfonyl, nitro, trifluoromethyl, or taken together methylenedioxy, wherein $R_3$ is lower alkyl or cycloalkyl of 3 to 7 carbon atoms, and $R_4$ is hydrogen or lower alkyl; and

R is



or —Z—$OR_3$

wherein Z is a branched or unbranched alkylene chain containing from 2 to 6 carbon atoms in the principal chain and a total of up to about 12 carbon atoms, and $R_3$ is as defined above, and acid addition salts thereof.

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**4,298,743**

## 4-(SUBSTITUTED PHENYL THIAZOLYL)-3-HYDROXY-3-PYRROLINE-2,5-DIONES

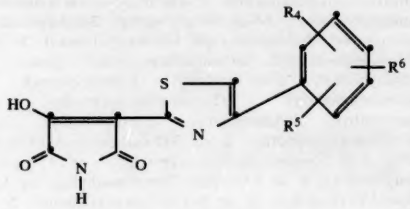
**Edward J. Cragoe, Jr., Lansdale; Clarence S. Rooney, Worcester, both of Pa., and Haydn W. R. Williams, Dollard des Ormeaux, Canada, assignors to Merck & Co., Inc., Rahway, N.J.**

**Filed Sep. 11, 1979, Ser. No. 74,465**

**Int. Cl.**[3] **C07D** *417/04;* **A61K** *31/425*

**U.S. Cl. 548—203** **10 Claims**

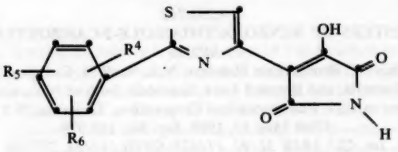
1. Compounds having the structure



wherein

$R_4$, $R_5$ and $R_6$ are independently hydrogen, halogen, straight chained loweralkyl having 1 to 3 carbon atoms, loweralkoxy having 1 to 3 carbon atoms and the pharmaceutically acceptable salts thereof.

2. Compounds having the structure:



wherein

$R_4$, $R_5$ and $R_6$ are independently hydrogen, halogen, straight chained loweralkyl having 1 to 3 carbon atoms, loweralkoxy having 1 to 3 carbon atoms and pharmaceutically acceptable salts thereof.

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**4,298,744**

**METHOD FOR PREPARING (αS,5S)-α-AMINO-3-CHLORO-2-ISOXAZOLINE-5-ACETIC ACID (AT-125) AND ANALOGS THEREOF**

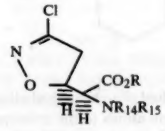
**Robert C. Kelly, and Wendell Wierenga, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.**

**Continuation-in-part of Ser. No. 20,141, Mar. 13, 1979, abandoned, which is a division of Ser. No. 905,963, May 15, 1978, abandoned. This application Jul. 13, 1979, Ser. No. 57,310**

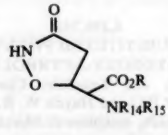
**Int. Cl.**[3] **C07D** *209/48, 261/04*

**U.S. Cl. 548—240** **12 Claims**

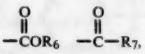
1. A process for preparing racemic mixtures and optically active isomers of a compound having the formula



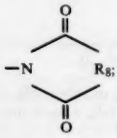
which comprises chlorinating a compound having the formula



wherein R is selected from the group consisting of hydrogen, alkyl of from 1 to 8 carbon atoms, inclusive, halogenated alkyl of from 1 to 3 halogen atoms, and 1 to 5 carbon atoms, inclusive and aralkyl of from 7 to 20 carbon atoms, inclusive and substituted aralkyl of from 7 to 20 carbon atoms, inclusive; and $R_{14}$ and $R_{15}$ are selected from the group consisting of hydrogen,

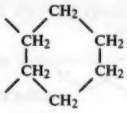


inclusive, or when taken together with the nitrogen atom form the group



wherein $R_6$ is alkyl of from 1 to 8 carbon atoms, inclusive, halogenated alkyl of from 1 to 5 carbon atoms, inclusive, and 1 to 3 halogen atoms, inclusive, aralkyl of from 7 to 20 carbon atoms, inclusive, and substituted aralkyl of from 7 to 20 carbon atoms, inclusive, $R_7$ is selected from the group consisting of alkyl of from 1 to 12 carbon atoms, inclusive, aryl of from 6 to 20 carbon atoms, inclusive, aralkyl of from 7 to 20 carbon atoms, inclusive, substituted aralkyl of from 7 to 20 carbon atoms, inclusive, and $R_8$ is selected from the group consisting of

where $R_9$, $R_{10}$, $R_{11}$ and $R_{12}$ are selected from the group consisting of hydrogen and alkyl of from 1 to 5 carbon atoms, inclusive, (b)



(c) orthointerphenylene, and (d) substituted orthointerphenylene.

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**4,298,745**

**HYDANTOIN DERIVATIVES**

**Gordon Wootton, Herts, and Richard W. Moore, Harlow, both of England, assignors to Beecham Group Limited, England**

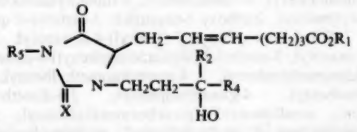
**Continuation of Ser. No. 4,897, Jan. 19, 1979, abandoned. This application Nov. 19, 1979, Ser. No. 95,339**

**Claims priority, application United Kingdom, Jan. 23, 1978, 02694/78; May 12, 1978, 19232/78**

**Int. Cl.**[3] **C07D** *233/54*

**U.S. Cl. 548—313** **15 Claims**

1. A compound of the formula:



wherein

X is O or S;

$R_1$ is hydrogen, or $CO_2R_1$ represents an ester group in which $R_1$ contains from 1 to 12 carbon atoms;
$R_2$ is hydrogen or alkyl of 1 to 4 carbon atoms;
$R_4$ is alkyl of 1 to 9 carbon atoms; and
$R_5$ is alkyl of 1 to 6 carbon atoms; and the alkali metal, alkaline earth metal, ammonium and substituted ammonium salts thereof when $R_1$ is hydrogen.

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**4,298,746**

## N-(SUBSTITUTED PHENYL)-N'-(2-IMIDAZOLIDINYLIDENE)UREAS

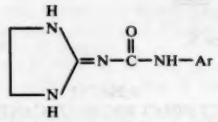
**Chris R. Rasmussen, Ambler, Pa., assignor to McNeilab, Inc., Fort Washington, Pa.**

**Continuation-in-part of Ser. No. 972,579, Dec. 22, 1978, Pat. No. 4,229,462. This application Jun. 6, 1980, Ser. No. 156,900**

**Int. Cl.³ C07D *233/44***

**U.S. Cl. 548—315** **7 Claims**

2. An N-(Substituted phenyl)-N'-(2-imidazolidinylidene)urea compound of the formula:



or a pharmaceutically-acceptable acid addition salt thereof, wherein Ar is phenyl substituted with one or two substituents independently selected from methyl, chloro, bromo or methoxy.

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**4,298,747**

## BIS(DIHYDROXYMETHYLOXOIMIDAZOLIDINYL)ALKANES

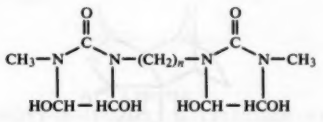
**John G. Frick, Jr., New Orleans, and Robert J. Harper, Jr., Metairie, both of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.**

**Filed Aug. 25, 1980, Ser. No. 180,544**

**Int. Cl.³ C07D *233/40***

**U.S. Cl. 548—318** **3 Claims**

1. A bis substituted alkane compound having the following structure:



wherein n is 2 or 3.

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**4,298,748**

## PREPARATION OF 2-IMIDAZOLINES

**Toni Dockner, Meckenheim; Uwe Kempe, Limburgerhof; Herbert Krug, Ludwigshafen; Peter Magnussen, Bad Duerkheim; Werner Praetorius, Darmstadt, and Hans J. Szymanski, Schifferstadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany**

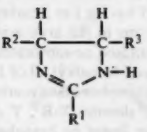
**Filed Nov. 27, 1979, Ser. No. 97,814**

**Claims priority, application Fed. Rep. of Germany, Dec. 16, 1978, 2854428**

**Int. Cl.³ C07D *233/10, 233/06***

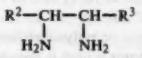
**U.S. Cl. 548—347** **14 Claims**

1. A process for the preparation of a 2-imidazoline of the formula



I

where $R^1$, $R^2$ and $R^3$ may be identical or different and each is an aliphatic, cycloaliphatic, araliphatic or aromatic radical, and $R^2$ and $R^3$ may also each be hydrogen, by catalytic reaction of a 1,2-diamine with a carbonyl compound or a nitrile, wherein a 1,2-diamine of the formula



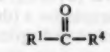
II

where $R^2$ and $R^3$ have the above meanings, is reacted
(a) with a nitrile of the formula



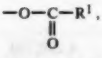
III

or
(b) with a carbonyl compound of the formula



IV

where $R^1$ has the above meaning and $R^4$ is $—OR^2$, $—NH^2$ or



$R^1$ and $R^2$ having the above meanings, in the gas phase at from 200° to 450° C. in the presence of silicon dioxide.

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**4,298,749**

## PYRAZOLE ETHER DERIVATIVES

**Peter Plath, Ludwigshafen; Wolfgang Rohr, Mannheim; Bruno Wuerzer, Limburgerhof, and Rainer Becker, Bad Durkheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany**

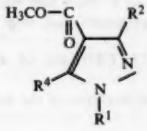
**Division of Ser. No. 49,506, Jun. 18, 1979, abandoned. This application Mar. 4, 1980, Ser. No. 127,088**

**Claims priority, application Fed. Rep. of Germany, Jul. 4, 1978, 2829289**

**Int. Cl.³ C07D *231/20, 231/22***

**U.S. Cl. 548—377** **2 Claims**

1. A pyrazole ether derivative of the formula



where $R^1$ denotes

X denoting oxygen and $R^5$ denoting hydrogen, alkyl of 1 to 16 carbon atoms which is unsubstituted or substituted by halogen, or alkoxy of 1 to 4 carbon atoms; alkenyl of 2 to 6 carbon atoms

which is unsubstituted or chlorosubstituted; cycloalkyl of 3 to 8 carbon atoms; aralkyl having 1 to 3 carbon atoms in the alkyl and 6 to 10 carbon atoms in the aryl; aryl of 6 to 10 carbon atoms which is unsubstituted or substituted by fluoro, chloro, bromo, alkyl, alkoxy, and haloalkyl all of 1 to 4 carbon atoms, cyano, nitro, alkoxycarbonyl or alkoxycarbonylamino of 1 to 3 alkyl carbon atoms, $R^2$ denotes Y-$R^7$, Y denoting oxygen or sulfur and $R^7$ denoting linear or branched alkyl of 1 to 18 carbon atoms which is unsubstituted or mono- or polysubstituted by fluoro, chloro, bromo, cyano, nitro, cycloalkyl, alkoxy or alkylthio of 1 to 4 carbon atoms; unsubstituted or fluoro-, chloro-, methoxy-, methyl- or trifluoromethyl-substituted aryloxy of 6 to 10 carbon atoms in the aryl; alkoxycarbonyl, alkylaminocarbamoyl or dialkylaminocarbonyl of 1 to 4 carbon atoms in the alkyl; acyloxy of 2 to 4 carbon atoms in the acyl; linear or branched alkenyl of 3 to 18 carbon atoms which is unsubstituted or mono- or polysubstituted by chloro; cycloalkyl of 3 to 8 carbon atoms which is unsubstituted or mono- or polysubstituted by alkyl, alkoxy, haloalkyl of 1 to 4 carbon atoms, fluoro, chloro or bromo; aryl of 6 to 10 carbon atoms which is unsubstituted or mono- or polysubstituted by fluoro, chloro, bromo, cyano, trifluoromethyl, nitro, or by alkyl, alkoxy, alkylthio, alkoxycarbonyl, alkylaminocarbonyl or dialkylaminocarbonyl, each alkyl being of 1 to 4 carbon atoms; aryl of 6 to 10 carbon atoms which is substituted by phenyl or phenoxy which in turn may be substituted by fluoro or chloro; or phenyl substituted by lower ($C_1$ to $C_4$) alkyl esters of (thio)-glycolic acid or (thio)-lactic acid via a (thio)-ether bond, and $R^4$ denotes hydrogen or methyl, and agriculturally acceptable acid addition salts thereof.

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**4,298,750**

## BORANE-1,4-THIOXANE

**Herbert C. Brown, West Lafayette, Ind., assignor to Aldrich-Boranes, Inc., Milwaukee, Wis.**

**Filed Feb. 19, 1980, Ser. No. 122,285**
**Int. Cl.³ C07D *327/06***
**U.S. Cl. 549—4** **4 Claims**

**1**. Borane-1,4-thioxane.

**3**. A process of producing borane-1,4-thioxane which comprises contacting 1,4-thioxane with diborane.

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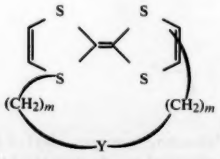
**4,298,751**

## CYCLICALLY SUBSTITUTED FULVALENOPHANES

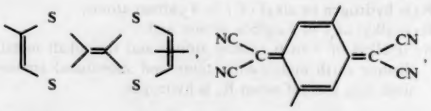
**Heinz Staab, Heidelberg, and Joachim Ippen, Cologne, both of Fed. Rep. of Germany, assignors to Basf Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany**

**Filed Aug. 8, 1980, Ser. No. 176,402**
**Claims priority, application Fed. Rep. of Germany, Sep. 14, 1979, 2937225**
**Int. Cl.³ C07D *495/02, 495/22***
**U.S. Cl. 549—11** **3 Claims**

**1**. A tetrathiafulvalenophane of the formula

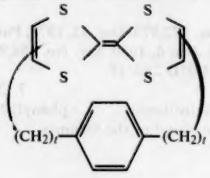


where m is 2, 3, 4 or 5 and Y is



or p-phenylene which may contain cyano, nitro or halogen substituents.

**3**. A tetrathiafulvalenoparacyclophane of the formula



where t is 3, 4 or 5.

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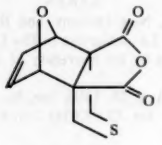
**4,298,752**

## CYCLOADDUCT PRECURSORS OF CANTHARIDIN AND METHOD

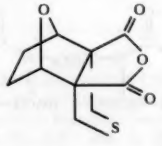
**William G. Dauben, Berkeley; Carl R. Kessel, Union City, both of Calif., and Kazuo H. Takemura, Omaha, Nebr., assignors to Regents of the University of California, Berkeley, Calif.**

**Filed Sep. 19, 1980, Ser. No. 188,883**
**Int. Cl.³ C07D *493/18***
**U.S. Cl. 549—42** **16 Claims**

**7**. A compound of the structure

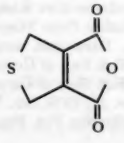


**8**. A compound of the structure



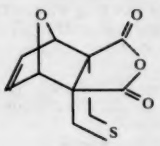
**12**. A method for producing cantharidin comprising the steps of:

providing a dienophile of the structure



contacting said dienophile with furan to form a reaction solution;

pressurizing said reaction solution at a sufficient pressure to cause formation of a cycloadduct of the structure



and thereafter reducing and desulfurizing said cycloadduct to form cantharidin.

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**4,298,753**

## CONTINUOUS PROCESS FOR PREPARING SILANES AND SILOXANES HAVING SiOC GROUPS

**Anton Schinabeck; Norbert Zeller, both of Burghausen; Tassilo Lindner, Mehring-Öd, all of Fed. Rep. of Germany; Georg Engelsberger, Ach, Austria, and Rudolf Riedle, Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany**

**Filed Nov. 24, 1980, Ser. No. 209,447**

**Claims priority, application Fed. Rep. of Germany, Jan. 10, 1980, 3000782**

**Int. Cl.³ C07F** *7/04, 7/10, 7/18*

**U.S. Cl. 556—415** **5 Claims**

1. A continuous process for preparing silanes and polysiloxanes containing SiOC groups which comprises (a) introducing in parallel flow a silicon compound having Si-bonded chlorine and a hydroxyl-containing aliphatic compound in a liquid phase, into a first stage of a first reactor in an amount of from 0.5 to 0.9 gram-mole of hydroxyl group per gram-atom of Si-bonded chlorine; (b) removing the liquid reaction mixture from the first reactor; (c) introducing the reaction mixture into a second stage at the head of a column forming a second reactor which is maintained at an elevated temperature; (d) adding a hydroxyl-containing aliphatic compound as a gas to the column at a point between the lower end and the upper end of the lower one-third of the column in an amount sufficient to at least completely react with the remaining Si-bonded chlorine in the reaction mixture obtained from the first stage and (e) removing the reaction product from the column at a point below the point of addition of the hydroxyl-containing aliphatic compound.

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**4,298,754**

## 15-DEOXY-16-HYDROXY-16-(1'FLUOROVINYL) PROSTAGLANDINS AND DERIVATIVES

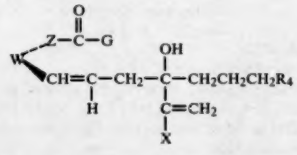
**Middleton B. Floyd, Jr., Suffern, N.Y., assignor to American Cyanamid Company, Stamford, Conn.**

**Filed Jun. 7, 1979, Ser. No. 46,726**

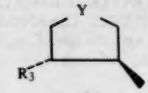
**Int. Cl.³ C07C** *177/00*

**U.S. Cl. 560—121** **20 Claims**

1. Compounds of the formula



or a racemic mixture thereof and the mirror image thereof wherein W is



wherein Y is

$R_3$ is selected from the group hydrogen and hydroxy; $R_4$ is selected from the group hydrogen and $C_1$ to $C_3$ alkyl; G is selected from the group hydroxy and $C_1$ to $C_6$ alkoxy; Z is selected from the group $-(CH_2)_n-$, $-(CH_2)_mOCH_2-$, and $-(CH_2)_mSCH_2-$ wherein n is the integer 5 to 8, and m is the integer 3 to 6; and X is selected from the group fluorine, chlorine and bromine and when G is hydroxy and the pharmaceutically acceptable salts thereof.

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**4,298,755**

## CATALYTIC OXYDEHYDROGENATION PROCESS

**Chelliah Daniel, and Phyllis L. Bursky, both of Columbus, Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.**

**Filed Feb. 25, 1980, Ser. No. 124,030**

**Int. Cl.³ C07C** *51/377, 57/05, 67/317, 69/54*

**U.S. Cl. 560—214** **4 Claims**

1. In a process for the catalytic conversion of isobutyric acid or a lower alkyl ester thereof to the corresponding $\alpha,\beta$-ethylenically unsaturated derivative via the oxydehydrogenation reaction wherein an iron phosphate catalyst is contacted with a gaseous feed stream containing said acid or ester substrate and oxygen at a temperature between about 300° and 500° C., the improvement of effecting said oxydehydrogenation reaction in the presence of a modified iron phosphate catalyst having the gram-atom empirical formula $FeP_1.2Ag_{0.01\text{-}1}O_x$ in which x represents the number of oxygen atoms bound to the other elements in their respective states of oxidation in the catalyst.

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**4,298,756**

## 1R, CIS 2,2-DIHALOVINYL-3,3-DIMETHYLCYCLOPROPYLMETHANOL AND ESTER DERIVATIVES

**Pieter A. Verbrugge, and Petrus A. Kramer, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.**

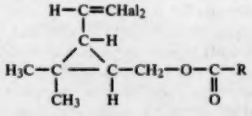
**Division of Ser. No. 32,847, Apr. 24, 1979, abandoned. This application Sep. 24, 1979, Ser. No. 78,276**

**Claims priority, application United Kingdom, Aug. 17, 1978, 33763/78**

**Int. Cl.³ C07C** *69/145, 69/24, 33/44*

**U.S. Cl. 560—231** **5 Claims**

1. A (1R,cis) compound of the formula:



wherein R is an alkyl group containing from 1 to 4 carbon atoms and $Hal_2$ is two halogen atoms having an atomic number from 9 to 35.

**4,298,757**

## 2-[2-(2,2-DIHALOVINYL)-3,3-DIMETHYLCYCLOPROPYL ]VINYL ALKANOATES

**Johannes Van Berkel, and Hendrik C. Kelderman, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.**

**Filed Jul. 9, 1979, Ser. No. 55,858**

**Claims priority, application United Kingdom, Jul. 19, 1978, 30337/78**

**Int. Cl.³ C07C** *69/145, 69/24*

**U.S. Cl. 560—231** **3 Claims**

1. A (1R,cis)-2-[2-(2,2-dihalovinyl)-3,3-dimethylcyclopropyl]vinyl alkanoate wherein each halo independently is chloro, fluoro or bromo and the alkanoate moiety contains from 2 to 6 carbon atoms.

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**4,298,758**

## PROCESS FOR THE PRODUCTION OF PROPYLENE GLYCOL ESTERS FROM CHLOROPROPYL ETHERS

**Frank T. Cook, and Donald G. Prier, both of Baton Rouge, La., assignors to The Dow Chemical Company, Midland, Mich.**

**Filed Feb. 11, 1980, Ser. No. 120,438**

**Int. Cl.³ C07C** *67/10, 67/24, 69/16*

**U.S. Cl. 560—240** **3 Claims**

1. The preparation of propylene glycol esters from dichloroisopropyl ether by reacting said ether with a lower carboxylic acid and an alkali metal salt of said acid at elevated temperature in the range of about 125° to 300° C. and pressure in the range of from about atmospheric up to about 1000 pounds per square inch guage for a time sufficient to convert substantially all of said chloroether to form a mixture of propylene glycol and dipropylene glycol diesters wherein the mol ratio of the salt to the chloroether is at least about 2 to 1.

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**4,298,759**

## SEPARATION OF COBALT AND MANGANESE FROM TRIMELLITIC ACID PROCESS RESIDUE BY EXTRACTION, ION EXCHANGER AND MAGNET

**Jon J. Harper, Naperville, and Stephen J. Pietsch, Oak Park, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.**

**Filed Dec. 19, 1980, Ser. No. 218,059**

**Int. Cl.³ C07C** *51/42;* **B01J** *37/00;* **C01G** *45/00, 49/00*

**U.S. Cl. 562—485** **4 Claims**

1. A method of separating cobalt and manganese from residue of trimellitic acid manufacture and from each other where such residue is obtained by separating trimellitic acid from the product of oxidizing liquid pseudocumene in the presence of cobalt and manganese as metal oxidation catalyst, which method comprises extracting said residue with water in the water to residue weight ratio of from 0.25:1 to 6:1 at a final temperature of from 25° C. up to 100° C., contacting the extract solution or a suspension of insolubles in the extract solution with an acid form of cation exchanger, separating the resulting solution or suspension from the exchanger, regenerating the exchanger with an aqueous solution of a strong inorganic acid, collecting the spent aqueous acid solution resulting from said regeneration, adjusting the ph of said collected aqueous solution to a pH of at least 6 while also adding powdered manganese metal to precipitate cobalt as a metal and dissolve the manganese metal, passing the manganese-treated pH-adjusted solution containing suspended metallic cobalt over one or more magnets, recovering the cobalt metal-free aqueous solution, washing metallic cobalt from the magnets with hydrochloric or hydrobromic acid, and dissolving the metallic cobalt in the acid wash.

**4,298,760**

## PROCESS FOR PREPARING 1-AMINOCYCLOPROPANE-1-CARBOXYLIC ACID

**Shy-Fuh Lee, Sunnyvale, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.**

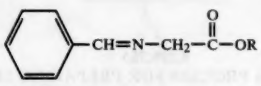
**Filed Aug. 14, 1980, Ser. No. 178,062**

**Int. Cl.³ C07C** *51/09*

**U.S. Cl. 562—506** **4 Claims**

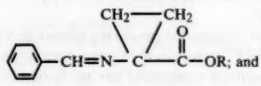
1. A process for the preparation of the compound 1-aminocyclopropane-1-carboxylic acid which comprises the steps:

(a) of reacting a compound of the formula



(1)

wherein R is lower alkyl, unsubstituted aryl or aryl substituted at one, two or three of the ring carbon atoms with a group selected from lower alkyl, lower haloalkyl, halogen, nitro, cyano or hydroxy, with the compound $X(CH_2)_2X$ wherein X is bromo, chloro or iodo, in the presence of a base to produce a compound of the formula



(2)

(b) hydrolyzing said compound (2) to prepare 1-aminocyclopropane-1-carboxylic acid.

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**4,298,761**

## PREPARATION OF 4-NITROTHIOANISOLE

**Hermann Hagemann, Cologne; Erich Klauke, Odenthal, and Gerd-Michael Petruck, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany**

**Filed Jan. 9, 1980, Ser. No. 110,588**

**Claims priority, application Fed. Rep. of Germany, Jan. 30, 1979, 2903505**

**Int. Cl.³ C07C** *149/32*

**U.S. Cl. 568—44** **13 Claims**

1. A process for the preparation of 4-nitrothioanisole comprising successively in a single vessel and without intermediate isolation reacting 4-nitrochlorobenzene with $Na_2S_2$, then with an alkaline $Na_2S$ solution and with a methylating agent.

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**4,298,762**

## PROCESS FOR THE OXIDATION OF PRIMARY ALLYLIC AND BENZYLIC ALCOHOLS

**William J. Ehmann, Orange Park, and Walter E. Johnson, Jr., Jacksonville, both of Fla., assignors to SCM Corporation, New York, N.Y.**

**Continuation of Ser. No. 582,113, May 30, 1975, abandoned. This application Dec. 5, 1979, Ser. No. 100,558**

**The portion of the term of this patent subsequent to Oct. 25, 1994, has been disclaimed.**

**Int. Cl.³ C07C** *45/29*

**U.S. Cl. 568—433** **7 Claims**

1. An Oppenauer oxidation of a primary alcohol selected from the group consisting of; methallyl alcohol, perillyl alcohol, myrtenol, benzyl alcohol, p-hydroxy benzyl alcohol, saligenin, vanillyl alcohol and 2,6-dimethyl-2,7-octadien-1-ol to the corresponding aldehyde in the presence of from 1 to 15 mol percent based on the alcohol charged of an Oppenauer oxidation catalyst and furfural as the hydrogen acceptor under mild temperature Oppenauer oxidation conditions said temperature

being in the range of from ambient temperature to 75° C., said hydrogen acceptor being present in a molar ratio of furfural to primary alcohol of about 10:1–1:10, and forming a reaction product mixture containing the aldehyde corresponding to the primary alcohol, and as a by-product, furfuryl alcohol.

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**4,298,763**

## PREPARATION OF α,β-OLEFINICALLY UNSATURATED ALDEHYDES OF 3 OR 4 CARBON ATOMS

**Heinz Engelbach, Limburgerhof; Richard Krabetz, Kirchheim; Gerd Duembgen, Dannstadt-Schauernheim; Carl-Heinz Willersinn, and Walter Beitelschmidt, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany**

**Filed Mar. 3, 1980, Ser. No. 126,896**

**Claims priority, application Fed. Rep. of Germany, Mar. 12, 1979, 2909597**

**Int. Cl.³ C07C *47/22***

**U.S. Cl. 568—479** **3 Claims**

1. In a process for the preparation of acrolein or methacrolein by oxidation of propylene or isobutylene with an oxygen-containing gas mixture under conventional conditions over a supported catalyst possessing a firmly adhering coating, from 150 to 1,500 μm thick, which contains calcined catalytic material of the composition

$$Mo_{12}Bi_{0.1-4}Fe_{0.5-6}P_{0-1}Me_b^2Me_c^3Me_e^5O_x$$

where $Me^2$ is Ni and Zn, $Me^3$ is K, Rb and/or Cs, $Me^5$ is In and/or Na, b is 8 to 9, b for Ni being 5.5 to 8.5, c is from 0.01 to 0.1, e is from 0.01 to 0.2, and x is the number of oxygen atoms required to saturate the valencies of the other constituents, and a carrier core having a surface area of less than 15 $m^2/g$ and a diameter of more than 100 μm, the improvement that the coated catalyst employed has been prepared by applying calcined catalytic material having a particle size of from 0.1 to 300 μm, in an amount of from 1 to 40 g/min/liter of carrier and water in a weight ratio of catalytic material to water of from 1:1 to 8:1, continuously and separately from one another, each at a constant speed, to vigorously agitated carrier particles which may or may not have been pre-moistened with water in an amount of up to 95% of the water absorbency of the particles, the preparation of the catalyst being carrier out in such a way that the water content of the coating which forms is less than the maximum degree of saturation of the catalytic material.

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**4,298,764**

## PREPARATION OF ALKYL GLYCERYL ETHER ALCOHOLS

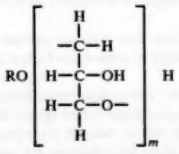
**Sidney Berkowitz, Highland Park, N.J., assignor to FMC Corporation, Philadelphia, Pa.**

**Continuation-in-part of Ser. No. 61,219, Jul. 27, 1979, abandoned. This application Mar. 21, 1980, Ser. No. 132,485**

**Int. Cl.³ C07C *41/03***

**U.S. Cl. 568—618** **13 Claims**

1. A process for preparing n-alkyl glyceryl ether alcohols of the general formula:



wherein R is a $C_{10}$–$C_{20}$ n-alkyl radical and m is a number from 1 to about 10, which comprises the steps of bringing together and reacting a $C_{10}$–$C_{20}$ n-alkyl primary alcohol and crude glycidol which is predissolved in a non-polar, non-reactive and miscible solvent selected from the group consisting of benzene, toluene, ortho-xylene, meta-xylene, para-xylene and mesitylene, in the presence of a basic catalyst in a reaction zone, said alcohol and glycidol being brought together and reacted in a molecular ratio within the range of from about 1:0.9 to about 1:10; maintaining the resulting reaction mass in an agitated condition; maintaining the temperature of the reaction mass within the range of from about 125° to about 180° C. during the reaction period; separating said non-polar solvent from the reaction mass; and recovering a $C_{10}$–$C_{20}$ n-alkyl glyceryl ether alcohol product.

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**4,298,765**

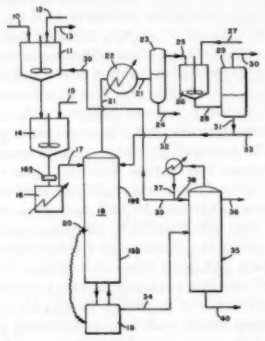
## PURIFICATION OF PHENOL WITH REDUCED ENERGY CONSUMPTION

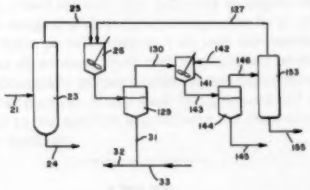
**Jerry R. Cochran, Chatham, N.J.; Thomas H. Insinger, Philadelphia; Gerald E. Hollenbach, Feasterville, both of Pa.; Ronald F. Piskorz, Cheektowaga, and Addison M. Smith, Amherst, both of N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.**

**Filed Mar. 26, 1980, Ser. No. 134,040**

**Int. Cl.³ C07C *37/76***

**U.S. Cl. 568—754** **10 Claims**





1. In the process of purifying phenol produced by the cleavage of cumene hydroperoxide wherein the feed phenol is treated with a base, the treated phenol is steam distilled to remove a lites fraction as a water azeotrope and the bottoms of the steam distillation are distilled to recover high purity phenol as an overhead; the improvement wherein the overheads of the steam distillation are condensed and organics are extracted with an organic solvent which preferentially dissolves benzofuran impurities to produce a reflux aqueous phase and the reflux aqueous phase is returned to the steam distillation.

4,298,766

**PREPARATION OF 2-METHYL-PENTANE-2,4-DIOL**

**Franz J. Broecker; Karl G. Baur, both of Ludwigshafen; Rolf Platz, Mannheim, and Joachim Stabenow, Weinheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany**

**Filed Sep. 17, 1979, Ser. No. 76,392**

**Claims priority, application Fed. Rep. of Germany, Oct. 2, 1978, 2842942**

**Int. Cl.**[3] **C07C** *29/136*

**U.S. Cl. 568—862** **1 Claim**

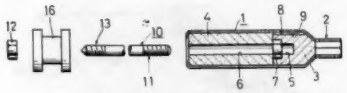
1. A process for the preparation of 2-methyl-pentane-2,4-diol by catalytically hydrogenating diacetone-alcohol at an elevated temperature, wherein a catalyst obtained by heating a compound of the formula $Ni_6Al_2(OH)_{16}CO_3.4H_2O$ for from 5 to 24 hours at from 300° to 450° C. and treating the resulting product with hydrogen for from 12 to 60 hours at from 300° to 450° C. is used and wherein the hydrogenation is carried out at a pressure of from 1 to 300 bar and at from 50° to 120° C. in two trickle reactors, the first reactor being operated with recycling and the second reactor without recycling.

**4,298,767**

## SUPPORT FOR A HEATING ELEMENT IN AN ELECTRIC FURNACE

**Seiichi Takigawa, Nagoya, Japan, assignor to Taki Industries Co., Ltd., Japan**

**Filed Jun. 23, 1980, Ser. No. 161,684**
**Claims priority, application Japan, Jun. 26, 1979, 54-80988**
**Int. Cl.³ F27D** *1/10;* **H05B** *3/06*
**U.S. Cl. 13—25** **9 Claims**




1. A support for a heating element in an electric furnace, said support comprising:
- a cylindrical holder made of heat resisting metal and fixed to the wall surface of said electric furnace;
- a pair of separated insulators secured within said cylindrical holder and having central holes respectively;
- a stud bolt made of heat resisting metal of which one end being detachably engaged through said central holes with a member provided within one of said insulators;
- heat insulating layers being laminated on said wall surface of said electric furnace over the other end of said stud bolt; and
- a hook insulator mounted to said other end of said stud bolt for hanging said heating element.

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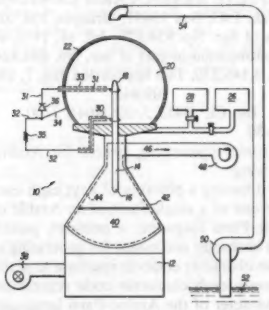
**4,298,768**

## CESIUM VAPOR THERMIONIC CURRENT GENERATOR

**Allan D. Israel, P.O. Box 5627, Lexington, Ky. 40555, and Herbert H. Fowler, 1532 Yates Crescent #42, Lexington, Ky. 40505**

**Filed Mar. 13, 1979, Ser. No. 20,180**
**Int. Cl.³ H01L** *37/00, 35/30*
**U.S. Cl. 136—202** **12 Claims**



1. An electron current generator comprising
(a) a heat source
(b) a heat pipe having its first end suspended in thermal relationship with the heat source at its second end projecting upward therefrom,
(c) a closed chamber surrounding said second end and containing an alkali metal vapor maintained at a substantially reduced pressure with respect to the atmosphere,
(d) cooling means for cooling the surface of the chamber remote from said heat pipe second end,
(e) a first and a second wire attached to said heat pipe second end, the first wire leading to an electrical load outside said chamber, the second wire traversing said chamber to a voltage stabilizing forward biased solid state diode network outside said chamber and
(f) an electrical conductor attached to said surface of the chamber remote from said heat pipe second end leading to a common electrical junction between said load and said diode network.

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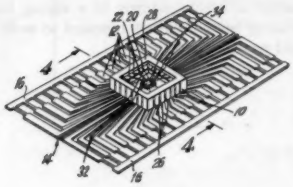
**4,298,769**

## HERMETIC PLASTIC DUAL-IN-LINE PACKAGE FOR A SEMICONDUCTOR INTEGRATED CIRCUIT

**Paul Richman, St. James, N.Y., assignor to Standard Microsystems Corp., Hauppauge, N.Y.**

**Continuation of Ser. No. 103,727, Dec. 14, 1979, abandoned, which is a continuation of Ser. No. 916,837, Jun. 19, 1978, abandoned. This application Jan. 28, 1981, Ser. No. 229,193**
**Int. Cl.³ H05K** *5/06*
**U.S. Cl. 174—52 FP** **6 Claims**




1. A hermetic package for a semiconductor chip, said package comprising a ceramic chip carrier including a recessed portion having a bottom surface and at least one raised surface surrounding said recessed portion, a plurality of spaced conducting fingers arranged on said raised surface and extending to and terminating at the bottom surface of said chip carrier, a semiconductor chip in said recessed portion and including a plurality of bonding locations thereon, a corresponding plurality of bonding wires connected between said bonding locations and selected ones of said conducting fingers, a lid covering said carrier and sealing said chip within said carrier, and a lead frame separate from said chip carrier and having a significantly larger surface area than that of said chip carrier, said lead frame including a plurality of substantially rigid but bendable space leads constituting a free-standing assembly, each of said leads including spaced inner ends extending inwardly toward and terminating at a central portion of said lead frame to define the periphery of a central opening in said lead frame, said chip carrier being mounted to said lead frame over said central opening and being supported by said inner ends of said leads, said inner ends of said leads also being electrically connected to said conducting fingers at the bottom surface of said chip carrier, each of said leads further including an angular intermediate portion integral with and projecting away from said inner end and an outer portion integral with said intermediate portion and bent downward from said intermediate portion in a direction substantially perpendicular to said intermediate portion, said outer portions of said leads being spaced and substantially parallel to one another and defining the external connections for the package.

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**4,298,770**

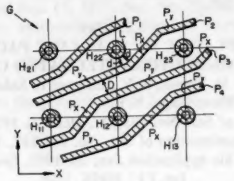
## PRINTED BOARD

**Mikio Nishihara, Yokohama; Masahiro Oda, and Takamitsu Tsuchimoto, both of Kawasaki, all of Japan, assignors to Fujitsu Limited, Japan**

**Filed Aug. 24, 1979, Ser. No. 69,346**
**Claims priority, application Japan, Aug. 25, 1978, 53/103453**
**Int. Cl.³ H05K** *1/02*
**U.S. Cl. 174—68.5** **14 Claims**

1. A printed board comprising:
- a board having a plurality of through holes formed therein and located on intersecting points of an X-Y orthogonal

basic grid, and an oblique conductor pattern formed on said board, wherein conductors are formed along channels, one conductor passes between adjacent grid points arranged in an X direction, two or more conductors pass



between adjacent grid points in a Y direction, and each conductor obliquely extends in a zigzag line with the meandering being regularly repeated so as to not contact the grid points.

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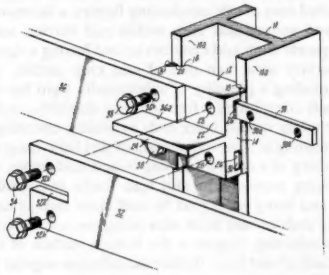
**4,298,771**

## BOLTED/WELDED JOINT AND METHOD OF PERFECTING SAME

**William F. Olashaw, Plainville, Conn., assignor to General Electric Company, New York, N.Y.**

**Filed May 19, 1980, Ser. No. 150,856**
**Int. Cl.³ H02G *5/00***
**U.S. Cl. 174—71 B** **15 Claims**



**1.** An electrical bus joint joining first and second aluminum busbars, said bus joint comprising, in combination:

A. an aluminum connector including a body welded in electrical connection with the first busbar and a projection rising from a planar surface of said body;

B. means forming an opening in a terminal portion of the second busbar;

C. fixturing means incorporated in the terminal portion of the second busbar and said connector body accommodating clamping the second busbar terminal portion in electrical connection with said planar body surface with said projection protruding through said opening in the second busbar terminal portion; and

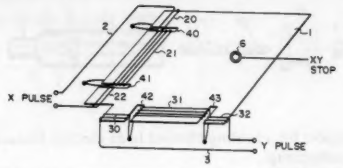
D. a weld electrically joining said projection to the second busbar along the edge of said opening therein and maintaining the clamped electrical connection between the second busbar terminal portion and said planar body surface achieved by said fixturing means.

**4,298,772**

## COORDINATE READER USING ADJUSTABLE MAGNETOSTRICTIVE OSCILLATIONS

**Toshihiko Kobayashi, Musashino, and Tetsusaburo Kamibayashi, Niza, both of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan**

**Filed Jul. 6, 1979, Ser. No. 55,279**
**Claims priority, application Japan, Jul. 7, 1978, 53-81975**
**Int. Cl.³ G01R *33/00*; G01B *7/14*; G08C *21/00***
**U.S. Cl. 178—18** **8 Claims**




**1.** A coordinate reader comprising: a magnetostrictive plate, a plurality of excitation means each including at least three coils mounted on the magnetostrictive plate in two directions of coordinate axes along its marginal edges for generating magnetostrictive oscillation waves in the magnetostrictive plate, a detection coil employed to be placed at a desired position on the propagation paths of the magnetostrictive oscillation waves, measuring means for obtaining a numerical value of the coordinates of the position of the detection coil from a time difference between the excitation of the magnetostrictive plate by the excitation means and the detected output from the detection coil, and adjusting means for adjusting said excitation means so as to adjust the numerical value obtained by said measuring means so that when the detection coil is disposed on the magnetostrictive plate at each position equally spaced from each of the coordinate axes, substantially equal numerical values are obtained from the measuring means.

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**4,298,773**

## METHOD AND SYSTEM FOR 5-BIT ENCODING OF COMPLETE ARABIC-FARSI LANGUAGES

**Khaled M. Diab, P.O. Box 13457, Orlando, Fla. 32859**

**Continuation of Ser. No. 924,679, Jul. 14, 1978, abandoned, which is a continuation-in-part of Ser. No. 846,824, Oct. 31, 1977, Pat. No. 4,145,570. This application Jan. 7, 1980, Ser. No. 109,943**
**Int. Cl.³ B41J *5/00*; H04L *3/00***
**U.S. Cl. 178—30** **16 Claims**

**1.** An electronic typewriting system for Arabic-Farsi languages comprising:

a. a keyboard having a plurality of keys each corresponding to at least one of a single form of an Arabic character of the Arabic-Farsi language, a numeral, punctuation and command character and means for generating a succession of multi-bit character codes in response to actuation of the keys, wherein each character code represents one of an Arabic character of the Arabic-Farsi language, numerals, punctuation and command character and the character code for each Arabic character is independent of the form thereof;

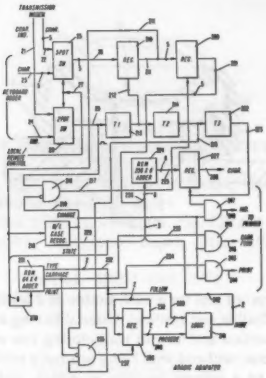
b. an Arabic adapter for converting the form independent character codes into the proper language form for display comprising

i. means dividing the characters into one of at least three groups and for inserting one of at least three multi-bit level codes into the succession of character codes to identify at least one associated character code as representing characters of one of the three groups of characters;

ii. means for receiving and storing the codes for at least two successive characters;

iii. means responsive to the stored codes for classifying each received character as one of a plurality of predetermined character types; and

iv. means for generating a form code for each received Arabic character identifying same as one of four Arabic character forms in response to the classification of the character immediately preceding and immediately following the Arabic character under consideration; and



c. display means responsive to the received codes and the form code for each of a succession of characters for displaying the last entered character in a first display without regard to form and for displaying each Arabic character in its proper form in successive positions in a second display including means for displaying the successive characters in the same position in response to an indication from the means for classifying that a received character is of a predetermined type for which the display position is not to change.

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**4,298,774**

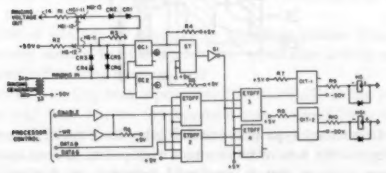
## CALL WAITING SIGNAL ARRANGEMENT

**Julius Jusinskas, Jr., Glen Ellyn, Ill., assignor to GTE Automatic Electric Labs Inc., Northlake, Ill.**

**Filed May 2, 1979, Ser. No. 35,139**

**Int. Cl.³ H04M *3/02, 3/42***

**U.S. Cl. 179—18 BG** **2 Claims**



**1.** A signalling arrangement for applying a call waiting signal to selected ones of a plurality of telephone lines connected to a telephone exchange, wherein said exchange includes a ringing signal generator, a ringing signal distribution bus and a control means, and further including a rectifier means and a connect means comprising a relay having a set of make and break contacts operated to connect said ringing generator to said distribution bus via said make contacts and alternately to connect said ringing generator to said bus via said rectifier means and said break contacts, a ringing signal bus connect means associated with each telephone line for connecting said line to said ringing signal bus, and control means operative upon the indication of a call waiting condition for a particular line, to operate said ringing signal bus connect means associated with said line in the alternate periods of said connect means, whereby said ringing signal distribution bus is alternately used for distributing said ringing signal and said call waiting signal.

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**4,298,775**

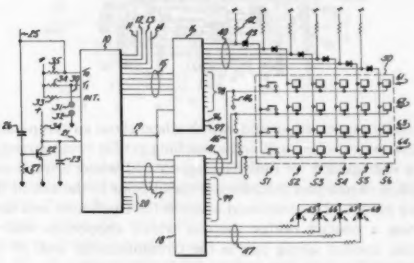
## MICROPROCESSOR CONTROLLED TELEPHONE SET

**Norman R. Buck, Sioux Falls, S. Dak., and David J. Hanson, Apple Valley, Minn., assignors to Vital Signs, Inc., Minnetonka, Minn.**

**Filed Mar. 14, 1979, Ser. No. 20,325**

**Int. Cl.³ H04M *1/00***

**U.S. Cl. 179—81 R** **7 Claims**



**1.** A telephone set for use in a telephone network having a switch gear connected to incoming telephone lines and to a plurality of telephone stations for establishing communication between selected stations and/or incoming lines, the telephone set including means for receiving and transmitting voice communications and the switch gear having a memory capability to receive command and control signals from the telephone set, transmit confirmation and control signals to the telephone set, and perform selected functions in response to the the command and control signals, comprising:

(a) a plurality of manually actuated switches, each of said switches corresponding to a selected function;

(b) a programmable microprocessor having means for automatically scanning said switches, detecting an actuated switch and generating a plurality of command and control signals in a predetermined sequence associated with a selected function;

(c) means for transmitting selected ones of said command and control signals to the switch gear; and

(d) means for receiving confirmation and control signals from the switch gear and transmitting said confirmation and control signals to said microprocessor.

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**4,298,776**

## MOTOR VEHICLE IGNITION-STARTER SWITCH

**Siegfried Sondermann, Honsel 290, 5880 Lüdenscheid, Fed. Rep. of Germany**

**Filed May 29, 1979, Ser. No. 43,477**

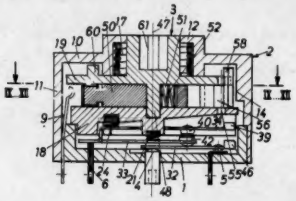
**Claims priority, application Fed. Rep. of Germany, Jun. 3, 1978, 2824464**

**Int. Cl.³ H01H *9/00, 21/18***

**U.S. Cl. 200—11 C** **9 Claims**

**1.** In a motor vehicle ignition-starter switch having a housing including a base part provided with a middle contact and a plurality of border contacts, a switch wheel having a first switching bridge permanently abutting the middle contact and arranged to be rotated into contact with border contacts on said base part, a bridging element having a double-contact head in contact with a contact of said first switching bridge and arranged to be rotated into contact with further border contacts, a further switching bridge, making contact through a take-off contact on said double-contact head and arranged to

slidably engage said border contacts; the connecting bridges and the bridging element being pretensioned by springs toward the base part, and a springably pretensioned starting repetitive retaining element the improvement comprising: two ring segment contact bridges of the switch wheel on ring wall portions thereof, which cooperate with two contact spring pairs and being guided in a circumferential wall of the housing and an ignition repetitive retaining element in the form of a catch,



pivotally supported on said switch wheel about an axis parallel to the switch wheel axis and a catching profile being arranged on a slide guided for radial sliding on said wheel toward said catch, a switch part extending perpendicular to the axis of the catch pivot and pretensioned towards the catch axis, said slide having a contact bridge thereon which cooperates with a further contact spring pair in the circumferential wall of the housing.

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**4,298,777**

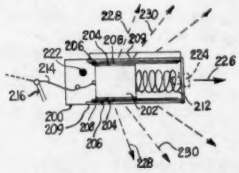
**DISTRESS GAS GENERATING SIGNAL BALLOON APPARATUS**

**Clyde C. Bryant, 1920 Forrest Ave., East Point, Ga. 30344**

**Division of Ser. No. 831,120, Sep. 7, 1977, Pat. No. 4,185,582. This application Oct. 25, 1979, Ser. No. 88,140**

**Int. Cl.³ H01H** *35/00*

**U.S. Cl. 200—61.45 R** **8 Claims**



**1.** A unidirectional inertial activator comprising a casing, a mass having front and rear faces held within the casing and conforming to the shape of the casing, friction pads and friction plates surrounding said mass, pressure plates surrounding said friction plates, a thin elastic layer within said casing surrounding said pressure plates, said friction plates and friction pads being pressed against said mass by said pressure pads and having a high coefficient of friction with said mass, a pressure responsive means located proximate to the front face of said mass and serving to separate said mass from the front wall of said casing, and an activating means connected to the rear face of said mass in a manner that if the activator is subjected to a force greater than its angle of repose, the activating means is employed.

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**4,298,778**

**WATERPROOF SEAL FOR A PUSH-BUTTON**

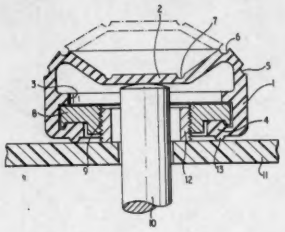
**Godric P. K. Beresford-Jones, Sandbanks, Seal, Near Sevenoaks, Kent, England**

**Filed Jan. 23, 1980, Ser. No. 114,661**

**Claims priority, application United Kingdom, Jan. 25, 1979, 02745/79**

**Int. Cl.³ H01H** *9/04*

**U.S. Cl. 200—302** **5 Claims**



**1.** A waterproof seal for a push-button in a panel; comprising a shroud of flexible and resilient material having a substantially cylindrical portion and an end wall closing one end to shroud the push-button; said end wall being normally resiliently biased from a first to a second position in which said end wall is inwardly collapsed to provide a visual and tactile indication of the position of the push-button; and sealing means for sealing the open end of said shroud to the panel.

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**4,298,779**

**ROTARY TYPE MICROSWITCH**

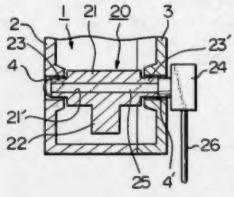
**Haruhiko Mihara, Tsu, Japan, assignor to Matsushita Electric Works, Ltd., Osaka, Japan**

**Filed Jan. 7, 1980, Ser. No. 110,102**

**Claims priority, application Japan, Jan. 13, 1979, 54/3122[U]; Jan. 13, 1979, 54/3123[U]; Jan. 13, 1979, 54/3261**

**Int. Cl.³ H01H** *3/04, 5/04*

**U.S. Cl. 200—335** **5 Claims**



**1.** In a rotary type microswitch wherein a movable contact carrier carries a movable contact opposed to at least one stationary contact and is displaced between its normal non-operating position and an operating position in response to an external force to change the contacting state of said movable contact relative to said stationary contact, the combination comprising a housing having two side walls provided at mutually opposing and axially aligned positions with a pair of shaft bearing holes respectively communicating the interior of the housing with the exterior, a handle member rotatably mounted in said bearing holes and including an arm extending generally laterally from an axis of rotation of said handle member and operably engaged with said movable contact carrier to displace the latter, said handle member including a hole extending axially therethrough and being open at both ends such that both ends are accessible from the exterior through said bearing holes, a shaft bar extending axially in said axial hole and being

non-rotatable relative to said handle member, a lever arm disposed exteriorly of said housing and coupled to one end of said bar through a respective bearing hole, said lever arm extending laterally of said axis to rotate said handle member and displace said movable contact carrier in response to an external force, the opposite end of said bar reaching the associated end of said handle member and being integrally fixed thereto.

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**4,298,780**

## MICROWAVE HEATING APPARATUS WITH RESISTIVE HEATERS

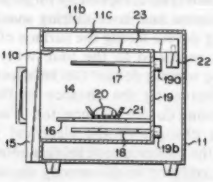
**Yukio Suzuki, Fuji, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan**

**Filed Mar. 12, 1980, Ser. No. 129,644**

**Claims priority, application Japan, Mar. 19, 1979, 54-35246[U]**

**Int. Cl.³ H05B *6/68, 6/76***

**U.S. Cl. 219—10.55 B** **5 Claims**




1. A microwave heating apparatus comprising:

a heating chamber for receiving food to be heated by said heating apparatus, said heating chamber having a wall with a bore therethrough;

a microwave generator for generating microwave energy to be conducted within said heating chamber for microwave heating food within said chamber;

a detachable resistive heating element for generating heat within said chamber for heating food within said chamber, said element having a voltage terminal and an insulating sheath wrapped about a portion thereof, the sheath having a projection thereon;

a control circuit for selectively coupling power from a power source to said microwave generator and/or said resistive heating element; and

a heater coupling means positioned substantially at the bore in said wall but on the opposite side thereof from said heating chamber for (a) holding said detachable resistive heating element within said chamber and (b) coupling electrical power from said control circuit to said terminal of said resistive heating element, said heater coupling means including

a displaceable member adapted to be displaced when an elbow portion thereof fully contacts with said projection of said insulating sheath whenever said detachable resistive heating element is inserted through said bore to a predetermined position within said heater coupling means; and

a switch element, actuable by said displaceable member, for inhibiting said control circuit from applying power to said microwave generator and resistive heating element when said heating element is not inserted to said predetermined position.

**4,298,781**

## WIRE-CUT ELECTROEROSION MACHINE AND METHOD OF OPERATING SAME

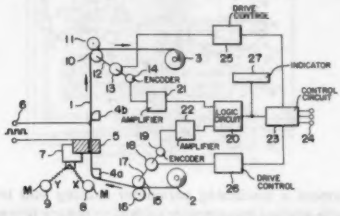
**Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan**

**Filed Apr. 30, 1979, Ser. No. 34,860**

**Claims priority, application Japan, Jun. 8, 1978, 53-69086; Jan. 24, 1979, 54-6106**

**Int. Cl.³ B23P *1/02***

**U.S. Cl. 219—69 W** **11 Claims**




1. A wire-cut electroerosion machine for cutting a workpiece with a continuous traveling wire constituting an electroerosion electrode, comprising:

supply means for said wire;

take-up means for said wire;

a pair of guide members for guiding said wire across a cutting zone in which a machinable portion of said workpiece is positioned;

rotary traction means having a first rotary shaft for advancing said wire through said cutting zone from said supply means and permitting said wire to be collected onto said take-up means downstream of said cutting zone;

rotary brake means having a second rotary shaft for applying a braking force to said wire to cause it to be stretched between said guide members while being continuously advanced through said cutting zone therebetween;

first sensing means responsive to the rotation of said first rotary shaft for providing a first electrical sensing signal representing the rate of rotation thereof;

second sensing means responsive to the rotation of said second rotary shaft for providing a second electrical sensing signal representing the rate of rotation thereof; and

circuit means responsive to said first and second electrical sensing signals for deriving therefrom an electrical output signal representing a deviation of tension of said wire advancing through said cutting zone between said brake and traction means from a predetermined value.

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**4,298,782**

## METHOD AND APPARATUS FOR STRAIGHTENING THE WIRE ELECTRODE OF AN ELECTRICAL DISCHARGE MACHINING APPARATUS

**Alain Wavre, Geneva, Switzerland, assignor to Ateliers des Charmilles, S.A., Geneva, Switzerland**

**Filed May 21, 1979, Ser. No. 40,673**

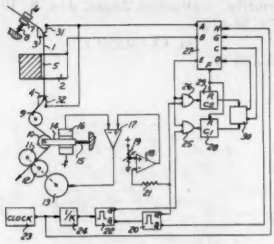
**Claims priority, application Switzerland, May 29, 1978, 5827/78**

**Int. Cl.³ B23P *1/02***

**U.S. Cl. 219—69 M** **31 Claims**

1. In a method for cutting by electrical discharges an electrode workpiece by means of an electrode tool in the form of a wire, wherein said wire is displaced relative to said workpiece by being supported by a pair of spaced-apart support and guiding means between which said wire is stretched by a predetermined force of traction applied to said wire, wherein successive voltage pulses are applied across said electrodes for triggering current pulses, and wherein a transverse force is applied to said wire tending to misalign said wire with said support and guiding means, the improvement comprising mea-

suring a signal representing machining efficiency, varying momentarily the predetermined force of traction applied to the wire, measuring the influence exerted by varying said predetermined force of traction upon said signal representing machining efficiency, and adjusting as a function of said last



measurement a machining parameter causing said transverse force to be applied on said wire such as to reduce to a minimum value the influence of said variation of force of traction upon said signal representing machining efficiency whereby said machining parameter is adjusted in a direction tending to align said wire with said support and guiding means.

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**4,298,783**

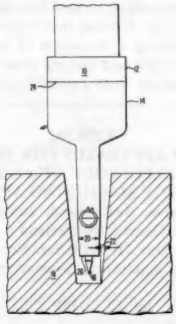
## DEEP NARROW GROOVE TUNGSTEN INERT GAS SHIELDED WELDING PROCESS

**Urban A. Schneider, St. Petersburg; Robert E. Monley; Robert L. Nelson, both of Tampa, and Raymond H. Glatthorn, St. Petersburg, all of Fla., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Sep. 20, 1979, Ser. No. 77,208**

**Int. Cl.³ B23K *9/16***

**U.S. Cl. 219—75** **3 Claims**



**1.** A method of applying a gas shielded tungsten arc welding process in a deep, narrow groove joint wherein the shield gas is directed to the weld puddle through an elongated gas nozzle which surrounds a substantial length of the welding electrode and is sized to extend into the groove, including the step of incrementally increasing the width of the nozzle to correspond to increases in the width of the groove at preselected increases in the width of the groove as the nozzle is withdrawn from the groove during successive weld passes.

**4,298,784**

## ARRANGEMENT FOR MEASURING THE DISTANCE BETWEEN A METALLIC WORKPIECE AND A PROCESSING TOOL

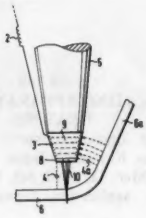
**Karl-Heinz Schmall, Moncalieristr. 5, 757 Baden-Baden, Fed. Rep. of Germany**

**Filed Jun. 29, 1979, Ser. No. 53,255**

**Claims priority, application Fed. Rep. of Germany, Jul. 7, 1978, 2829851**

**Int. Cl.³ B23K *9/10***

**U.S. Cl. 219—124.02** **7 Claims**



**1.** In an arrangement for measuring the distance between a metallic workpiece and a processing tool moved toward and away from the workpiece, especially for adjusting the distance of acetylene, plasma and laser cutting machines whereby at least one sensing device facing the surface of the workpiece to be processed is provided to the tool; wherein the electrical properties of the sensing device can be affected by selectively reducing and increasing the distance to the workpiece and whereby the sensing device is connected to an electrical circuit to evaluate the changes of the electrical properties of the sensing device, the improvement being a compensation sensing arrangement in addition to the sensing device, the compensation sensing arrangement being arranged laterally on the tool to be affected by elevations of the workpiece disposed parallel to the direction of movement of the tool, each of the sensing device and the compensation sensing arrangement having a reactance which can be affected by the workpiece to comprise a pair of reactances, one of the reactances being inductive and the other being capacitive, and the reactances are dimensioned and electrically connected in opposition in such a way that by a predetermined lateral approach of the workpiece to the electrodes the tool can be compensated by changes of the respective inductive and capacitive reactances which are numerically about equal but are electrically oppositely directed.

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**4,298,785**

## METHOD AND DEVICE FOR AUTOMATICALLY TRACKING SYSTEMS TO THE CENTER OF WELD GAPS, WELD JOINTS AND WELD REINFORCEMENTS

**Paul Krenzer, Hamm-Pelkum; Franz-Josef Peters; Karl-Heinz Schlusnus, both of Hamm, and Hans J. Wahl, Münster, all of Fed. Rep. of Germany, assignors to Hoesch Werke Aktiengesellschaft, Dortmund, Fed. Rep. of Germany**

**Continuation-in-part of Ser. No. 840,834, Oct. 11, 1977. This application May 2, 1979, Ser. No. 35,329**

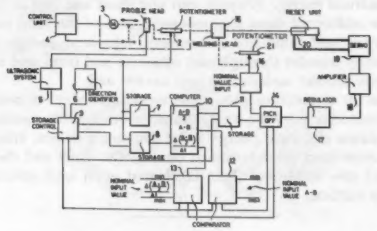
**Claims priority, application Fed. Rep. of Germany, Oct. 16, 1976, 2646838**

**Int. Cl.³ B23K *9/12***

**U.S. Cl. 219—124.34** **11 Claims**

**1.** A method for automatically tracking systems to the center of weld gaps, weld joints or weld reinforcements comprising the steps of: using at least one scanning probe for receiving signals reflected by a workpiece surface as long as said surface is substantially parallel to an acting surface of said probe, said signals breakdown spontaneously when the surface clearly deviates from the parallel as in the case with left and right flanks of gaps, joints or reinforcements; said signal breakdown being a decrease in intensity of a reflection signal to a fraction

of previous reflection energy; applying the breakdown of the signal for storing an electrical value corresponding to the instantaneous probe position, the probe position for the left flank when traveling from left to right and for the right flank when traveling from right to left; computing as a computed value the center of the gap, of the joint or of the reinforcement



from the stored electronic position values; comparing the computed value with an electrical value corresponding to the center position of the system; and forming a control command signal from a difference of compared values for actuating drive means to return said system to the computed center of the weld gap, said signals being evaluated only up to their first reflection breakdown per probe oscillation direction.

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**4,298,786**

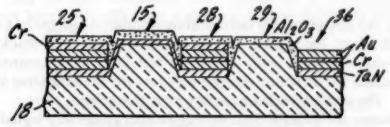
## THIN FILM THERMAL PRINT HEAD

**Edmund T. Marciniec, Libertyville, Ill., assignor to Extel Corp., Northbrook, Ill.**

**Continuation-in-part of Ser. No. 918,845, Jun. 26, 1978, Pat. No. 4,206,541. This application Oct. 1, 1979, Ser. No. 81,003**

**Int. Cl.³ H05B *3/16***

**U.S. Cl. 219—216** **5 Claims**




1. A thin-film dot matrix thermal print head comprising:
a dielectric substrate having a print head surface;
a film of high-resistance conductive material, formed in accordance with a predetermined pattern having intervening blank spaces, on the print head surface of the substrate;
a series of electrical connectors, each formed as a plurality of superimposed electrically conductive films covering predetermined portions of the high-resistance film, at least one of those films being of low-resistance material, a plurality of individual portions of the high-resistance film being left uncovered by the electrical connector films to define an array of resistance heater print elements;
the print head surface of the dielectric being depressed, in all areas covered by the electrical connectors to a depth approximately equal to or greater than the sum of the thicknesses of all of the superimposed films in such areas so that the print elements and the blank spaces are effectively elevated to at least approximately the level of the outermost surface of the electrical connectors, so that the connectors are effectively protected by both the print elements and blank spaces, and there are no depressions for accumulation of deposits of lint, ink, or the like.

**4,298,787**

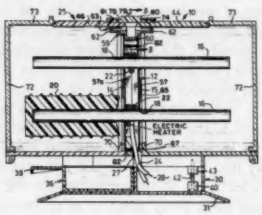
## APPARATUS FOR HEATING AND SETTING HAIR

**George Barradas, Greenwich, Conn., assignor to Appliance Design Probe Inc., Scarborough, Canada**

**Filed Jan. 17, 1980, Ser. No. 108,649**

**Int. Cl.³ H05B *1/00*; A45D *4/12***

**U.S. Cl. 219—222** **10 Claims**



1. A compact apparatus for heating and setting hair, comprising:
a central wall defined by two spaced-apart panels,
a plurality of heat-conductive elongated members, each passing through a separate pair of aligned apertures in said panels, and the free ends of each member extending away from the central wall in two opposing directions,
a plurality of hair-curling cylinders each having a central axial passageway adapted to receive an end of one of said elongated members,
a flexible rope-like heating element between the two spaced-apart panels and wound around each of the elongated members,
wire means connected with said heating element, by which electrical energy can be conveyed to the heating element from an external source,
said housing means enclosing the central wall, the elongate members, the heating element, and the cylinders when engaged with the elongated members.

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**4,298,788**

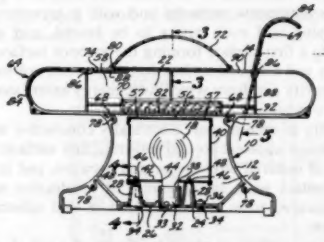
## TOY OVEN ASSEMBLY

**Lawrence T. Jones, Playa Del Rey; Anson Sims, Granada Hills; Ashley G. Howden; Mark S. Knighton, both of Los Angeles, and LC James Kingsbury, Fountain Valley, all of Calif., assignors to California R & D Center, Culver City, Calif.**

**Filed Jan. 25, 1980, Ser. No. 115,380**

**Int. Cl.³ H05B *1/00***

**U.S. Cl. 219—386** **10 Claims**



1. A toy oven assembly comprising:
a base member incorporating a heating element;
a substantially horizontally disposed cover member connected to the base member, the cover member incorporating a channel passing from a first end of the cover member to a second end of the cover member, the channel including space located directly above the heating element and

comprising a heating chamber, the channel being adapted for accommodating a tray which may be pushed through the channel and may be allowed to dwell in the heating chamber; the cover member further including on a top substantially horizontally disposed surface thereof a substantially circular aperture surrounded by a rim;

a substantially hemispherical dome comprising one of a transparent and a translucent material which is disposed directly above the heating chamber,

a lower edge of the dome being held by the rim, and

at least a first substantially J shaped access door mounted in the cover member, the access door selectively blocking or opening entry to the channel at the option of a player, the access door includes a front curved portion, an intermediate portion and an end portion, the access door is pivotably mounted to the cover member, the end portion of the access door including a notch adapted for allowing entry of the tray into the channel when the access door is in a position selectively allowing entry into the channel, the notch being sufficiently small so as to prevent entry of the child's hand or fingers into the channel.

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**4,298,789**

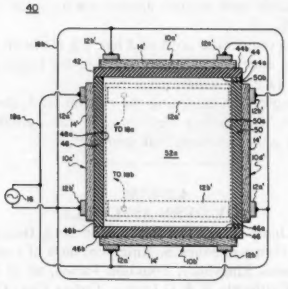
## OVEN HAVING A CAVITY HEATED BY AT LEAST ONE MONOLITHIC INTEGRATED HEAT SOURCE

**Charles W. Eichelberger; Charles E. Thomas, both of Schenectady, and Robert J. Wojnarowski, Clifton Park, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.**

**Filed Mar. 24, 1980, Ser. No. 132,812**

**Int. Cl.³ F27D *11/02*; A21B *1/00***

**U.S. Cl. 219—406** **24 Claims**



**1.** An oven having an oven cavity heated by conversion of electrical energy into heat energy, comprising:

a substrate fabricated of an electrically insulative and thermally conductive material and with a geometric shape enclosing said oven cavity to be heated, said substrate having a first surface forming the exterior surface of said cavity and a second surface forming an interior surface of said cavity and from which heat energy enters said cavity after conduction through said substrate;

a plurality of spaced-apart electrically conductive members positioned adjacent to said substrate first surface;

a sheet of material directly secured between, and in electrical contact with, said plurality of conductive members and secured to at least a portion of said substrate first surface;

at least one additional plurality of spaced-apart electrically conductive members positioned adjacent to said substrate first surface at a location remote from said plurality of conductive members;

at least one additional sheet of material, each secured to other portions of said substrate first surface different from the portion of said substrate first surface to which said sheet of material is secured, each of said at least one additional sheet directly secured and electrically connected between at least an associated pair of the at least one additional plurality of conductive members;

the material of said sheet and said at least one additional sheet having a predetermined electrical resistance measurable between different ones of said conductive and additional conductive members;

the resistance of said material of said sheet and of said at least one additional sheet of material causing conversion of electrical energy, coupled into said sheet and said at least one additional sheet via associated ones of the total number of said conductive members, into heat energy for energy transfer through said substrate and from said substrate second surface into said cavity; and

means for connecting a source of electrical energy to predetermined ones of the total number of conductive members to cause electrical energy to be converted to heat energy in associated predetermined ones of the sheet and the at least one additional sheet fabricated upon said substrate first surface.

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**4,298,790**

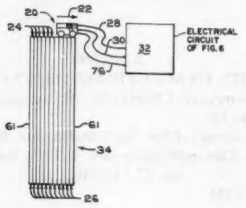
## METHOD OF AND APPARATUS FOR DETERMINING NUMBER OF SHEETS IN A STACK

**Forrest W. Decker, and Jacob R. Peternel, both of Pittsburgh, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.**

**Continuation of Ser. No. 891,364, Mar. 29, 1978, abandoned. This application Oct. 22, 1979, Ser. No. 87,184**

**Int. Cl.³ G06M *9/00***

**U.S. Cl. 235—92 SB** **15 Claims**




**1.** An apparatus for determining number of sheets in a stack, each sheet having an energy reflective side and stacked to provide the stack with an energy reflective side, comprising:

means for directing energy rays toward the reflective side of the stack to reflect energy rays therefrom;

means for generating a reflective energy density signal from the reflective energy rays as a function of pulse counts corresponding to position energy rays are reflected from the reflective side of the stack;

means for measuring nominal thickness of the sheets to be stacked;

means for determining (1) calculated sheet pulse counts from the density signal and pulse counts; (2) a working pulse range from the nominal thickness; and (3) a plurality of pulse values within the working pulse range;

means acting on the calculated sheet pulse counts and pulse values for determining a pair of sheet counts for each pulse value;

means for energizing said generating, measuring and determining means for initial determination of pair of sheet counts for each pulse value and subsequent determination of pair of sheet counts for each pulse value when the number of consecutive pairs of equal sheet counts is less than a predetermined number; and

means acted on by said energizing means when the number of consecutive pairs of equal pair of equal sheet counts is more than the predetermined number to provide acceptable pair of sheet counts for recording sheet count which is the sheet count of one of the pair of sheet counts included in the acceptable pair of sheet counts.

## 4,298,791
## SCANNING DEVICE FOR PRESELECTOR COUNTER MECHANISM

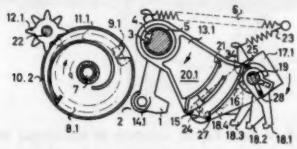
**Helmuth Müller, St. Georgen, and Lother Herrmann, Hornberg, both of Fed. Rep. of Germany, assignors to Kienzle Apparate GmbH, Villingen, Fed. Rep. of Germany**

**Filed Aug. 29, 1980, Ser. No. 182,805**

**Claims priority, application Fed. Rep. of Germany, Sep. 22, 1979, 2938410**

**Int. Cl.³ G06F** *15/18*

**U.S. Cl. 235—132 R** **7 Claims**




**1**. Apparatus for scanning the relative position of a preselector counter mechanism including a plurality of digital discs having radial cams which are rotated in accordance with the setting of preselected numerical values on said counter, each of said radial cams being provided with a scanning arm adapted to initiate a switching operation upon reaching a preselected state of said counter mechanism, said apparatus comprising a plurality of counter wheels each adapted to be set to a preselected value, an analogue metering value cam affixed to each of said counter wheels, each of said counter wheels and metering value cams being arranged to represent a decade of a decimal system numerical value, indexing pinion means gearing each of said counter wheel and metering value cam with those representing a next adjacent decade, multiarmed spring actuated swivel levers for scanning said metering value cams by decades and in sequence after release from a ready position from a higher decade to a next lower decade, and a switching shaft having stepped levers thereon interacting with said swivel levers, said swivel levers having an extension operating as a scanning arm scanning said metering value cams and another extension arm provided with functional plateaus for effecting release by decades of said swivel lever into the scanning position, said another extension arm operating to release said stepped levers for effecting a stepped control function of said switching shaft.

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## 4,298,792
## LOCKING APPARATUS FOR PREVENTING UNAUTHORIZED ACCESS

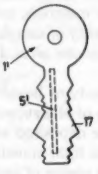
**Carl Granholm, Hastings on Hudson, N.Y., and Rudi Faude, Balingen, Fed. Rep. of Germany, assignors to BSG-Schalttechnik GmbH & Co., K.G., Balingen, Fed. Rep. of Germany**

**Continuation-in-part of Ser. No. 952,516, Oct. 18, 1978, Pat. No. 4,237,375. This application Nov. 22, 1978, Ser. No. 963,054**

**Claims priority, application Fed. Rep. of Germany, Nov. 22, 1977, 2752106; Oct. 5, 1978, 2843359**

**Int. Cl.³ G06F** *15/20;* **B60R** *25/00;* **G06K** *19/06, 7/016*

**U.S. Cl. 235—375** **30 Claims**




**1**. In an apparatus for actuating a locking device, a security device and the like, said apparatus including an actuator element containing information related to the authorized actuation of said locking device and the like, and further including receiver means for receiving said actuator element and containing guide means for guiding said actuator element along a predetermined longitudinal path and information retrieving means for retrieving said information presented to said retrieving means during movement of the actuator element along said longitudinal path, said apparatus further comprising means to process the information retrieved from said actuator element, the improvement wherein:

said actuator element is a key provided with two longitudinal tracks of coded data, each of which is composed of a sequence of uniformly spaced, different indicia, said data being carried in a non-mechanical manner, said two tracks containing the information to be processed by said apparatus and at the said time constituting a clock track for the apparatus, the code tracks being so disposed that for each data step, one or the other of the bits in said code tracks will change, the change thereof constituting the occurrence of a logical state (**1**) for bit changes in one of the tracks and a logical state (**0**) for a bit change in the other track, whereby the occurrence of bit changes in one or the other tracks is interpreted as a sequence of logical states constituting a clock sequence;

each of said coded tracks is associated with a reading assembly (**121***a*, **121***b*) whose output signals are fed to detectors (**129**) for detecting changes in the output signals of said reading assemblies and generating output signals that are combined in a gate circuit (**131**) and constitute the shifting cycle for the shift input of a shift register (**134**, **134'**);

the output signals of the detectors (**129**) are provided to switching inputs of a storage circuit (**135**) whose output is connected to the data input (**137**) of the shift register (**134**), whereby the bit pattern which corresponds to the clock sequence generated by the bit pattern itself is received in the shift register (**134**, **134'**); and

a coincidence circuit (**144**) determines the coincidence of the contents of the shift register (**134**) and the contents of a memory holding predetermined shift clock cycle and data information.

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## 4,298,793
## PORTABLE ELEMENT FOR RECEIVING, STORING, DISPLAYING AND OUTPUTTING DIGITAL DATA, AND A RESERVATION DEVICE FOR USE IN A RESERVATION SYSTEM

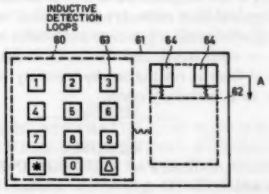
**Johannes H. A. M. Melis, and Willem Le Mair, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Feb. 9, 1979, Ser. No. 10,879**

**Claims priority, application Netherlands, Feb. 27, 1978, 7802132**

**Int. Cl.³ G06K** *19/06, 19/02;* **G09F** *9/30;* **G06F** *15/02*

**U.S. Cl. 235—487** **16 Claims**




**1**. A portable element for receiving, storing, displaying and outputting digital data, said portable element having data input, a memory having an at least partly modifiable content, a display device for the persistent display of digital data in the form of characters on the basis of data received on the data input, and a data output, for use in a reservation system having

at least one locally present reservation device and at least one service facility which is not locally present, characterized in that:

means to couple said data input and data output for coupling to an access device of the reservation device and for then receiving a proximity signal from the reservation device;

means to transmit, co-controlled by said proximity signal, identification data stored in said memory and a reservation request concerning the service facility to the reservation device in order to grant the reservation request;

means to unblock said system by a verification signal generated by said identification data after examination thereof in the reservation device;

said display device having means to display, under the control of the content of the memory modified by a signal of availability data from the reservation device, reservation data concerning a reservation of a service facility, the availability data in the reservation device being adapted at the same time.

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**4,298,794**

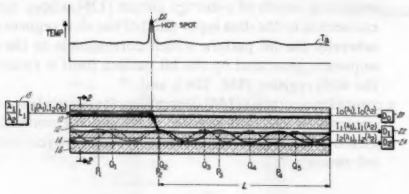
## FIBER OPTIC HOT SPOT DETECTOR

**Elias Snitzer, West Hartford, and Gerald Meltz, Avon, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.**

**Continuation-in-part of Ser. No. 71,511, Aug. 30, 1979, abandoned. This application Jun. 23, 1980, Ser. No. 162,285**

**Int. Cl.³ G02B** *5/14*

**U.S. Cl. 250—227** **9 Claims**




1. A hot spot detector, comprising:

means including an optical fiber having an input core and at least two secondary cores in a common cladding, said secondary cores being shaped and positioned to allow cross-talk therebetween, said input core and each of said secondary cores and said cladding being dimensioned and fabricated from such materials so as to support only the lowest order mode;

source means for presenting light of a predetermined wavelength for coupling into said input core;

detector means for receiving light of a predetermined wavelength emerging from said secondary cores; and

whereby if the temperature at any point along the length of said optical fiber exceeds a preselected value, light propagating along said input core cross-talks to said secondary core at such point, and the location of point along said optical fiber is related to the intensity of light emerging from said secondary cores.

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**4,298,795**

## METHOD AND APPARATUS FOR INTRODUCING SAMPLES TO A MASS SPECTROMETER

**Tsugio Takeuchi; Shin Tsuge, both of Nagoya; Yukio Hirata, Toyohashi, and Koichi Mochizuki, Tsushima, all of Japan, assignors to Japan Spectroscopic Co. Ltd, Tokyo, Japan**

**Filed May 11, 1979, Ser. No. 38,264**

**Claims priority, application Japan, Sep. 8, 1978, 53-111130**

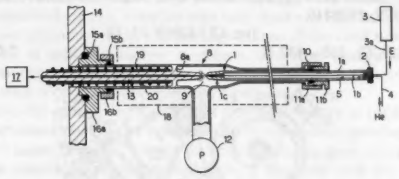
**Int. Cl.³ B01D** *59/44*

**U.S. Cl. 250—282** **19 Claims**

1. A method for continuously introducing a large molecular weight compound in vapor and fine particle form to an ion source of a mass spectrometer which comprises:

supplying a nebulizing gas to a nebulizing means;

spurting said nebulizing gas from a nozzle portion of said nebulizing means while continuously introducing a liquid solution of said compound to said nozzle portion whereby



a portion of said liquid solution is nebulized into finely divided particles by a jet stream of said nebulizing gas spurted from said nozzle portion and another portion of said liquid sample is vaporized; and

introducing the nebulized liquid solution to an ionizing portion of said mass spectrometer.

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**4,298,796**

## METHOD OF, AND APPARATUS FOR, MONITORING RADIOACTIVITY

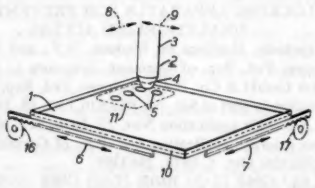
**Gerald T. Warner, Pullen's Field, Headington, Oxford, and Colin G. Potter, Ivy Cottage, Lower End, Leafield, Oxfordshire, both of England**

**Continuation of Ser. No. 835,038, Sep. 20, 1977. This application Jun. 22, 1979, Ser. No. 51,231**

**Claims priority, application United Kingdom, Sep. 24, 1976, 39853/76**

**Int. Cl.³ G01T** *1/00, 1/20*

**U.S. Cl. 250—328** **14 Claims**



1. Method of monitoring the beta emissions of a plurality of samples of radioactive materials, comprising the steps of:

depositing said plurality of samples on a single support layer in a plurality of discrete areas disposed in a predetermined pattern;

confining a single body of liquid scintillant in proximity to the surface region of said support layer where said plurality of samples are deposited as a whole to convert said beta emissions into light emissions, and;

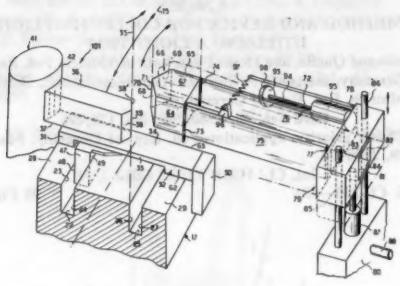
scanning the surface region of said support layer in a plurality of discontinuous steps to provide a plurality of output signals, each of which corresponds to at least a proportion of the light emissions activated by a respective one of said samples.

4,298,797

## SPECTROGRAPH USABLE IN PARTICULAR IN THE FAR ULTRAVIOLET

Claude R. Bernard, Longjumeau; Bernard Daigne, Chatillon, and Francois Girard, Paris, all of France, assignors to Office National d'Etudes et de Recherches Aerospaticles, France

Filed Feb. 9, 1979, Ser. No. 10,820
Claims priority, application France, Feb. 15, 1978, 78 04317
Int. Cl.[3] G01J *1/42, 3/28*
U.S. Cl. 250—372 5 Claims



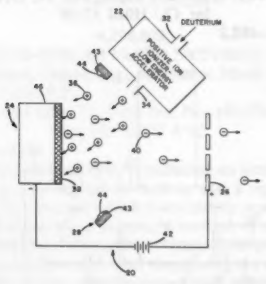
1. A spectrography apparatus of the Rowland type usable in the far UV range, comprising:
- a diffraction grating located on a point of the Rowland circle;
- a rail along a portion of the Rowland circle;
- at least one UV detector means, a support slidably mounting the detector means on said rail;
- an orienting means capable of linking said grating and said detector means for directing the latter towards the diffraction grating, said orienting means including a telescopic arm having an end close to said detector means, said end including a coupling means capable of coupling with said support;
- said coupling means being constituted by a cap which can be displaced downwardly in order to nest on said support and orient it towards the diffraction grating.

4,298,798

## METHOD AND APPARATUS FOR PRODUCING NEGATIVE IONS

Fred N. Huffman, Sudbury, Mass., assignor to Thermo Electron Corporation, Waltham, Mass.

Filed Nov. 29, 1979, Ser. No. 98,423
Int. Cl.[3] H01J *27/00*
U.S. Cl. 250—423 R 8 Claims



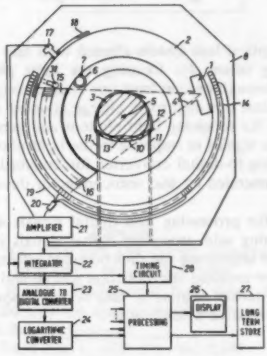

1. Apparatus for producing negative ions comprising:
- an ionization electrode comprising a substrate and a surface layer formed by the deposition on said substrate of products of thermal decomposition of cesium carbonate;
- means for supplying positive ions and for directing said positive ions to impinge upon the surface layer of said ionization electrode with a selected level of bombardment energy;
- extraction means for accelerating negative ions released from said surface layer following impingement of said positive ions on said layer; and
- means for replenishing the surface layer of said electrode with the products of decomposition of cesium carbonate.

4,298,799

## RADIOGRAPHY

Colin C. Oliver, Langley, England, assignor to EMI Limited, Hayes, England

Division of Ser. No. 772,689, Feb. 28, 1977. This application Apr. 19, 1978, Ser. No. 897,789
Claims priority, application United Kingdom, Mar. 3, 1976, 8417/76
Int. Cl.[3] G03B *41/16*
U.S. Cl. 250—445 T 9 Claims




1. Radiographic apparatus, for examining a body, including a least one x-ray tube projecting a fan-shaped distribution of x-rays through a slice of the body, means for angularly moving the at least one x-ray tube relative to the body about an axis intersecting the slice to cause the x-ray tube to project radiation through the body from a plurality of different directions, and a plurality of detector devices disposed along a curved path around the body, to an extent which subtends at the axis an angle substantially equal to or greater than 180° and fixed so as to be substantially prevented from angular movement around the body, in the direction of motion of the source, wherein the means for moving moves the said at least one x-ray tube to an extent sufficient to irradiate each of the detector devices, and including collimators moving angularly around the body together with the x-ray tube relative to the fixed detectors to reduce the incidence on the detectors of radiation transmitted through the body along indirect paths.

4,298,800

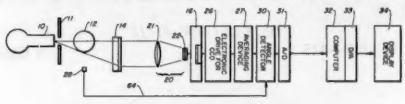
## TOMOGRAPHIC APPARATUS AND METHOD FOR OBTAINING THREE-DIMENSIONAL INFORMATION BY RADIATION SCANNING

Arnold Goldman, Houston, Tex., assignor to Computome Corporation, Houston, Tex.

Continuation-in-part of Ser. No. 881,549, Feb. 27, 1978, abandoned, which is a continuation of Ser. No. 664,910, Mar. 8, 1976, abandoned. This application Jan. 23, 1979, Ser. No. 5,687
Int. Cl.[3] G01N *23/00*
U.S. Cl. 250—445 T 15 Claims

1. A tomographic apparatus for examining a body by means of radiation such as x-ray or gamma radiation comprising:

(a) a body supporting structure for positioning a body relative to a rotatable source of radiation and relative to a detector,
(b) a source of penetrating radiation rotatable with respect to said body supporting structure and positioned on one side thereof,
(c) a radiation detector system located on the opposite side of said body supporting structure, rotatable or fixed, with respect thereto but fixed relative to said radiation source, which detection system comprises:
(I) means for receiving and converting radiation received from said radiation source into light photons, wherein said means for receiving and converting radiation is a fluoroscopic screen, or is a scintillation crystal, and said screen or crystal is inclined at an angle with respect to the axis of the beam generated by said source, thereby yielding a greater light photon output,



(II) an optical lens system aligned with said radiation converting means for focusing the light photons passing therethrough onto at least one charge coupled device.
(III) at least one electronic charge coupled semiconductor device for receiving light photons and generating analog electric signals in response to the light photons received;
(d) an analog-to-digital converter for converting the analog signals generated by said semiconductor device into digital signals,
(e) means for processing said digital signals and means for reconverting said processed digital signals into an analog signal and displaying the thus obtained information, and
(f) means for rotating said radiation source and said radiation receiving means relative to said body supporting structure but fixed relative to each other.

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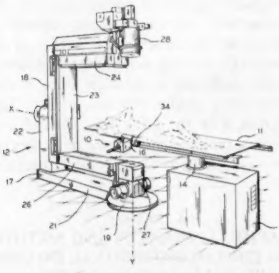
**4,298,801**

## L-U ARM HANDLE ASSEMBLY

**Christopher J. Heitman, and Gregory D. Schwehr, both of Milwaukee, Wis., assignors to General Electric Company, Milwaukee, Wis.**

**Filed Jan. 17, 1980, Ser. No. 112,866**
**Int. Cl.³ A61B *6/04***
**U.S. Cl. 250—447** **29 Claims**



**1.** An improved position control system for a medical diagnostic imaging apparatus of the type having an L-shaped support element rotatably disposed on a vertical axis, a U-shaped support element rotatably supported on a horizontal axis at the upper end of the L-shaped support element, and individual rotation systems for independently rotating the respective support elements on their axes, wherein the improvement comprises:
a control box which houses portions of the individual rotation systems, said box having an aperture formed therein;
a control handle for extending into said aperture to form a mechanical connection to the individual rotation systems; and
means for operating said control handle with a single hand of an operator to selectively actuate at least one of said rotation systems.

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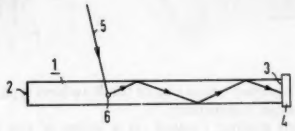
**4,298,802**

## METHOD AND DEVICE FOR COLLECTING LIGHT UTILIZING A LIGHT TRAP

**Ferdinand Quella, and Heinz Pape, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed Feb. 28, 1980, Ser. No. 125,496**
**Claims priority, application Fed. Rep. of Germany, Mar. 6, 1979, 2908770**
**Int. Cl.³ H05B *33/00*; G01J *1/58***
**U.S. Cl. 250—484** **28 Claims**



**1.** In a method for collecting light and displaying images, said method comprising providing a display with a body functioning as a light trap, said body containing fluorescent particles having an absorption range amd emitting light in an emission range, said body having at least one light decoupling window aligned with a light valve of the display, said method including absorbing light waves in the absorption range of the particles and emitting light in the emission range, the improvements comprising providing second fluorescent particles having an absorption range and an emission range different than the ranges of said first mentioned particles, and absorbing light in both ranges and emitting light in said two emission ranges.

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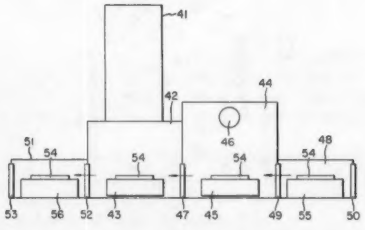
**4,298,803**

## PROCESS AND APPARATUS FOR MAKING FINE-SCALE PATTERNS

**Shizuya Matsuura, Nara, and Fumiya Konishi, Toyonaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaku, Japan**

**Filed Jan. 16, 1980, Ser. No. 112,464**
**Claims priority, application Japan, Jan. 19, 1979, 54-5092**
**Int. Cl.³ H01J *37/06***
**U.S. Cl. 250—492.2** **17 Claims**



**1.** In a process for making fine-scale patterns of a resist by projecting a radiation pattern on a resist film disposed on a substrate, said film having a predetermined sensitivity threshold level to said radiation such that a radiaton intensity below

said sensitivity threshold level does not sensitize the film, the improvement comprising the steps of:

projecting said radiation pattern on said resist film at a first intensity; and thereafter substantially uniformly exposing a desired area of said resist film to radiation at a second intensity less than said sensitivity threshold level,

the sum of said first and second intensities being greater than said sensitivity threshold level.

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**4,298,804**

## NEUTRON GENERATOR HAVING A TARGET

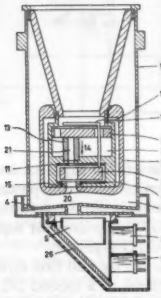
**Johannes K. E. Colditz, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Oct. 9, 1979, Ser. No. 83,011**

**Claims priority, application Netherlands, Oct. 13, 1978, 7810299**

**Int. Cl.³ G21G *4/02***

**U.S. Cl. 376—108** **9 Claims**



**1**. In a neutron generator target to be hit by a beam of hydrogen ions, said target including (a) an outer layer of a metal having a large coefficient of absorption for hydrogen, (b) a carrier layer of a metal having small coefficients of absorption and diffusion for hydrogen and a large coefficient of thermal conductivity, and (c) a first intermediate layer of a metal having a large coefficient of thermal conductivity and a low sputtering ratio, said first intermediate layer being between said outer and carrier layers,

the improvement in combination therewith of a second intermediate layer between said carrier and first intermediate layers, comprising a metal having a coefficient of linear expansion of a magnitude which is between that of the coefficients of linear expansion of said carrier and first intermediate layers, said outer, first intermediate, second intermediate and carrier layers being adhered together.

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**4,298,805**

## REGULATOR FOR A PULSED NEUTRON SOURCE

**Charles L. Dennis, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.**

**Filed Mar. 27, 1980, Ser. No. 134,376**

**Int. Cl.³ G21G *4/02***

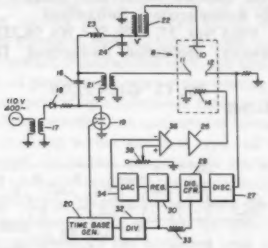
**U.S. Cl. 376—111** **5 Claims**

**1**. In a pulsed neutron system including an accelerator tube having a target, an ionization section, and a replenisher for supplying accelerator gas which is ionized by repetitive pulses applied to said ionization section, a method of adjusting the power supplied to the replenisher to control the pressure of the accelerator gas within said tube, comprising the steps of:

(a) monitoring the current through said ionization section and detecting current events occurring during said ionization pulses,

(b) increasing the power supplied to said replenisher in response to a decrease in the frequency of said incremental current events to increase the amount of accelerator gas supplied by the replenisher thereby increasing said accelerator gas pressure, and

(c) decreasing the power supplied to said replenisher in




response to an increase in the frequency of said current events to decrease the amount of accelerator gas supplied by said replenisher thereby decreasing said accelerator gas pressure.

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**4,298,806**

## APPARATUS FOR IRRADIATING SUBSTANCES CURABLE BY RADIATION

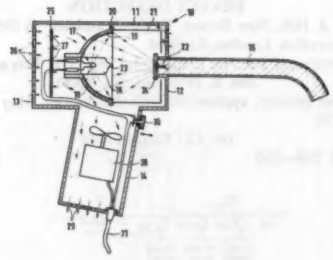
**Wolf-Dietrich Herold, Hechendorf, Fed. Rep. of Germany, assignor to ESPE Fabrik pharmazeutischer Praparate GmbH, Seefeld, Fed. Rep. of Germany**

**Filed Jan. 8, 1979, Ser. No. 1,590**

**Claims priority, application Austria, Jan. 23, 1978, 451/78**

**Int. Cl.³ G01J *1/00***

**U.S. Cl. 250—504 H** **16 Claims**



**1**. An apparatus for irradiating substances curable by radiation of a spectral range selected from the UVA and near-UVA visible wave length ranges, comprising

(a) a lamp for emitting a radiation including said selected spectral range;

(b) a selective reflector which reflects radiation of said selected spectral range and transmits radiation outside thereof, the reflector partially surrounding said lamp so as to converge the reflected radiation to a focus located outside said lamp at the side remote from said reflector; and

(c) an optical wave guide having an input end at said focus for guiding said reflected radiation to said substances.

**4,298,807**

## PROCESS FOR INSPECTING THE PHYSICAL STATE OF A PRINTED DOCUMENT AND AN INSTALLATION FOR PUTTING THE PROCESS INTO OPERATION

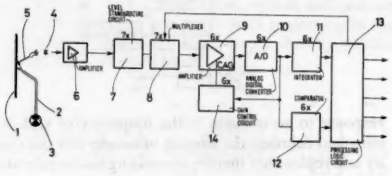
**Nicolas Favre, Cornaux, Switzerland, assignor to Compagnie Industrielle Radioelectrique, Switzerland**

**Filed Nov. 27, 1979, Ser. No. 98,332**

**Claims priority, application Switzerland, Dec. 1, 1978, 12290/78**

**Int. Cl.³ G01N *21/88***

**U.S. Cl. 250—562** **5 Claims**



1. A process for inspecting the physical state of a printed document wherein the document is caused to pass in front of a source of light and the light reflected is collected by means of photoelectric elements and compared with a reference value, characterised in that the document to be inspected is made to pass laterally with respect to a row of photoelectric elements, the signals delivered simultaneously by the row of photoelectric elements are successively transmitted by multiplexing, the analog signals delivered by the photoelectric elements are converted into digital signals, the digital signals are averaged in order to determine the general state of dirtiness of the document, the number of photoelectric elements of the row which are covered by the document are counted in order to determine the width of the document and to detect the presence of dog ears, the number of photoelectric elements delivering a signal which exceeds a certain level are counted to detect abnormal reflections, and each digital signal corresponding to a point of the document is compared with a reference value in order to determine the presence of a hole, a stain or a similar condition.

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**4,298,808**

## DEFECT DETECTION

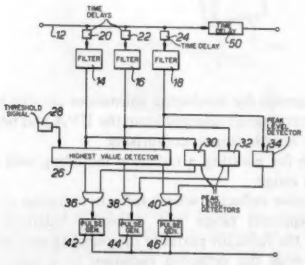
**Walter J. Hill, New Barnet, England, assignor to British Steel Corporation, London, England**

**Continuation of Ser. No. 794,068, Jul. 20, 1978. This application Jan. 8, 1979, Ser. No. 1,830**

**Claims priority, application United Kingdom, May 10, 1976, 19179/76**

**Int. Cl.³ G01N *21/88***

**U.S. Cl. 250—563** **18 Claims**



1. A method for indicating a defect in a workpiece, the method comprising applying a continuously variable signal derived from insepection of the workpiece and including a pulse component representative of the defect to a bank of filters having different frequency transmission characteristics respectively representative of defects of different type so that the filter corresponding most closely to the defect inspected, produces a relatively greater output and provides an indication of defect type.

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**4,298,809**

## GATE CIRCUIT FOR GATE TURN-OFF THYRISTOR

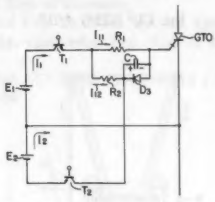
**Kenichi Onda, and Hisao Amano, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Sep. 24, 1979, Ser. No. 78,470**

**Claims priority, application Japan, Sep. 26, 1978, 53-118970**

**Int. Cl.³ H03K *17/72***

**U.S. Cl. 307—252 C** **3 Claims**



1. A gate circuit for a GTO thyristor comprising:

a first series connection of a first DC power source and a first switching element connected between the gate and cathode electrodes of said GTO thyristor for supplying a gate turn-on current to said GTO thyristor;

a capacitor being charged by said first series connection; and

a second series connection of a second DC power source and a second switching element connected in series with said capacitor between the gate and cathode electrodes of said GTO thyristor for supplying a gate turn-off current to said GTO thyristor.

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**4,298,810**

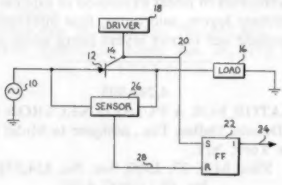
## SEMICONDUCTOR DEVICE CONDUCTION STATE DETECTION CIRCUIT

**Edward H. Dinger, Waynesboro, and Allen M. Ritter, Rocky Mount, both of Va., assignors to General Electric Company, Salem, Va.**

**Filed Jan. 14, 1980, Ser. No. 111,790**

**Int. Cl.³ H03K *17/72*; G01R *31/26***

**U.S. Cl. 307—252 N** **10 Claims**



1. A conduction state detection circuit for use with a thyristor responsive to an applied forward bias voltage and a gating signal to enter the conductive state comprising:

(a) bistable memory means responsive to first and second input signals to generate an output signal having a state indicative of the conductive state of said thyristor;

(b) means for supplying the gating signal for said thyristor to said memory means as said first input signal whereby said memory means is placed in a first of its bistable states and said output signal is of a first state; and,

(c) sensor means for sensing the voltage across said thyristor and for providing an output signal serving as said second

input signal whereby said memory means is placed in a second of its bistable states and said output signal is of a second state.

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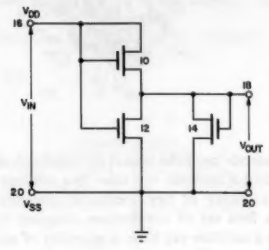
**4,298,811**

## MOS VOLTAGE DIVIDER

**Roelof H. W. Salters, Cupertino, and Joannes J. M. Koomen, Los Altos, both of Calif., assignors to Signetics Corporation, Sunnyvale, Calif.**

**Filed Jul. 20, 1979, Ser. No. 59,228**
**Int. Cl.³ H03K *3/01***
**U.S. Cl. 307—296 R** **3 Claims**




1. A voltage divider circuit, comprising:
(a) an input node, an output node, and a common node,
(b) first and second field effect transistors connected in parallel and having their respective drain and source electrodes connected in common across said output node and said common node, and
(c) a third field effect transistor connected directly across said input node and said output node and in series circuit with said parallel connected first and second field effect transistors across said input node and said common node, the gates of said first and third transistors being connected in common to said input node, and the gate of said second transistor being connected directly to said output node, said circuit producing a reduced dc voltage across said output node relative to dc voltage applied across said input node.

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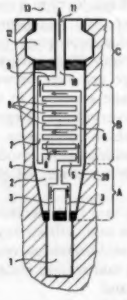
**4,298,812**

## GAS COOLED ROTOR FOR AN ELECTRIC MACHINE

**René Damiron, Cravanche; Roger Gillet, Belfort; Jean-François Heuillard, Cravanche, and Gilbert Ruelle, Belfort, all of France, assignors to Alsthom-Atlantique, Paris, France**

**Filed Oct. 25, 1979, Ser. No. 88,421**
**Claims priority, application France, Nov. 3, 1978, 78 31119**
**Int. Cl.³ H02K *1/32***
**U.S. Cl. 310—61** **3 Claims**



1. A rotor of an electric machine, said rotor including radial slots, winding coil conductors within said slots, subslots radially inboard of said slots and extending to the end of said rotor for causing cooling gas to enter said subslots axially and for movement through said radial slots for cooling of said winding coil conductors, cooling ducts shaped in said conductors and receiving said cooling gas, the improvement wherein said conductors are formed of first and second types, said first type being radially inward of said second type, said first type constituting a stack of perforated copper strips bearing slot-shaped first radial ducts providing a substantial radial path for the gas moving radially outwardly from said subslots through said first radial ducts provided within said first type coil conductors; said second type conductors comprising a stack of grooved copper strips, each strip including transverse ducts, said stack of grooved conductors forming second radial ducts on opposite sides of said stack, one of said second radial ducts being blocked at its radially outer end and being open at its radially inner end and in fluid communication with said first radial ducts, the other of said second radial ducts being closed off at its radially inner end and in open communication at its radially outer end to the periphery of said rotor such that said transverse ducts and said first and second radial ducts form an essentially transverse ventilation circuit in the form of a radiator and wherein said gas flows from said subslot radially through said first radial ducts within said first type coil conductors and enters said one second radial duct at the radially inner end thereof and passes transversely through said transverse ducts in parallel and exits radially from said other second radial duct through said radially outer end to the periphery of said rotor to effectively cool said first and second type conductors by cooling gas supplied solely from said subslots.

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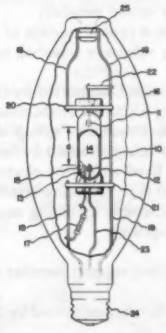
**4,298,813**

## HIGH INTENSITY DISCHARGE LAMPS WITH UNIFORM COLOR

**Peter D. Johnson, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.**

**Filed Oct. 23, 1978, Ser. No. 953,582**
**Int. Cl.³ H01J *61/20***
**U.S. Cl. 313—229** **3 Claims**



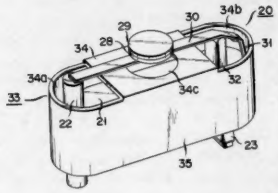
2. A metal halide-mercury arc discharge lamp including a light-transmissive discharge envelope having electrodes disposed at either ends thereof, comprising:
a metal halide disposed within said envelope; and
a quantity of elemental mercury also disposed within said envelope, and selected to be at a concentration of between approximately 0.7 $mg/cm^3$ and approximately 1.7 $mg/cm^3$, so that the voltage gradient along the discharge is between approximately 2 v/cm and approximately 10 v/cm.

4,298,814

## DIRECTLY HEATED TYPE CATHODE ASSEMBLY

Yukio Takanashi, Hiratsuka, and Toshiharu Higuchi, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 16, 1979, Ser. No. 85,317
Claims priority, application Japan, Oct. 17, 1978, 53-126823
Int. Cl.[3] H01J 1/46, 21/10
U.S. Cl. 313—302 19 Claims




1. An electron gun assembly comprising three directly heated type cathode assemblies constructed independently of each other, grid electrodes each having three electron beam passing holes, support rods for supporting the cathode assemblies and grid electrodes, and cathode support means for attaching the cathode assemblies to the support rods, each of the cathode assemblies comprising:

a cathode cylinder;

a first electroconductive support member supported by the cathode cylinder;

a conductive spring member supported by the cathode cylinder;

a ribbon filament supported at a first end by the first electroconductive support member and at a second end thereof by the conductive spring member;

a metal plate fixed to a central portion of the filament;

an electron-emitting substance attached to the metal plate; and

a second support member, supported by the cathode cylinder, for supporting a portion of the filament between the metal plate and the conductive spring member,

the cathode cylinder being attached to the cathode support means so as to be fixed within the electron gun assembly.

19. A directly heated type cathode assembly for connection into an electron gun assembly including more than one such cathode assembly, comprising:

a cathode cylinder;

a first electroconductive support member supported by the cathode cylinder;

a conductive spring member supported by the cathode cylinder;

a ribbon filament supported at a first end by the first electroconductive support member and at a second end thereof by the conductive spring member;

a metal plate fixed to a central portion of the filament;

an electron-emitting substance attached to the metal plate; and

a second support member, supported by the cathode cylinder, for supporting a portion of the filament between the metal plate and the conductive spring member,

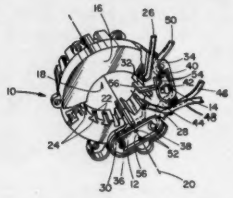
the cathode cylinder being adapted for connection within the electron gun assembly.

4,298,815

## CATHODE RAY TUBE SOCKET WITH CONTROLLED SPARK GAPS

Theodore M. Ishihara, Chicago, and John F. Kulkens, Park Ridge, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Nov. 9, 1979, Ser. No. 92,862
Int. Cl.[3] H01J 17/00, 21/00
U.S. Cl. 313—325 13 Claims




1. In a cathode ray tube socket for mechanically and electrically coupling a cathode ray tube to a television receiver including a plurality of first electrical connecting means for receiving a first set of conductors coupled to high voltage elements in a cathode ray tube, a plurality of second electrical connecting means for receiving a second set of conductors coupled to a plurality of high voltage sources in said television receiver, a dielectric housing having a central opening disposed therein with said first electrical connecting means disposed on the periphery of said central opening and said second electrical connecting means disposed on the outer periphery of said dielectric housing, a controlled spark gap for dissipating to neutral ground potential transient voltage surges originating in said cathode ray tube exceeding a precisely determined voltage level, said spark gap comprising:

means defining a cavity within said dielectric housing;

first electrode means disposed within said cavity, said first electrode means coupled to said first and second electrical connecting means;

second electrode means disposed within said cavity, said second electrode means coupled to neutral ground potential; and

wall means extending into said cavity and defining an aperture between said first and second electrodes, said wall means having a predetermined position between said electrodes corresponding to a predetermined breakdown voltage of said spark gap, said position being selected from a range of positions which corresponds to a range of spark gap breakdown voltages which includes said predetermined breakdown voltage, said range of breakdown voltages being such that the low end is associated with positions of said aperture nearest said first electrode.

9. A method of forming a high voltage spark gap having a precise breakdown voltage level in a cathode ray tube socket of a television receiver, said television receiver including a high voltage source, for protecting television receiver circuitry from transient overvoltage surges in a cathode ray tube caused by high voltage arc-over between high voltage elements and lower voltage elements in said cathode ray tube when said transient overvoltage surges exceed a predetermined voltage level, which comprises:

providing a cavity within said cathode ray tube socket;

fixedly positioning first and second electrode means in said cavity;

electrically coupling said first electrode means to said high voltage elements in said cathode ray tube and to said high voltage source in said television receiver;

electrically coupling said second electrode means to neutral ground potential; and

fixedly positioning rigid wall means in said cavity between said first and second electrodes so as to define an interelectrode aperture, said wall means having a predeter-

mined position between said electrodes corresponding to a predetermined breakdown voltage of said spark gap, said position being selected from a range of positions which corresponds to a range of spark gap breakdown voltages which includes said predetermined breakdown voltage, said range of breakdown voltages being such that the low end is associated with positions of said aperture nearest said first electrode.

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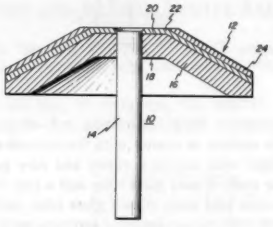
**4,298,816**

## MOLYBDENUM SUBSTRATE FOR HIGH POWER DENSITY TUNGSTEN FOCAL TRACK X-RAY TARGETS

**Harold H. Hirsch, and Melvin R. Jackson, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.**

**Filed Jan. 2, 1980, Ser. No. 109,163**
**Int. Cl.³ H01J *35/10***
**U.S. Cl. 313—330** **6 Claims**




1. An improved three-layer rotary X-ray target consisting of a substrate body of a molybdenum alloy having a high strength at the elevated operating temperature of the target, an intermediate ductile layer of molybdenum or a ductile molybdenum alloy, and a focal track target layer of a tungsten based alloy, said intermediate layer being contiguous with said substrate body and being situate at least in part between said substrate and said target layer, said molybdenum alloy of said substrate being characterized by a 0.2% yield strength at 1100° C. of at least 9000 psi and said molybdenum or ductile molybdenum alloy of said intermediate layer being characterized by a total elongation or reduction in area over the range of 25°–1100° C. of at least 1.3%, whereby the growth of cracks which originate in said focal track layer upon extended exposure to high energy electrons are terminated in said ductile intermediate layer and are prevented thereby from entering and propagating through said substrate body.

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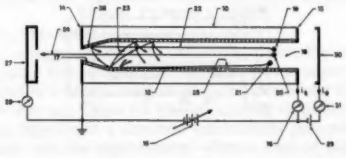
**4,298,817**

## ION-ELECTRON SOURCE WITH CHANNEL MULTIPLIER HAVING A FEEDBACK REGION

**Jean-Denis Carette, 1409 rue St-Clement, Ancienne Lorette, Quebec, Canada (G2E 3L7), and Claude Bouchard, 1680 Carre Ader, Apt. 2,, Duberger, Quebec, Canada (H1P 1H8)**

**Filed Aug. 13, 1979, Ser. No. 66,058**
**Int. Cl.³ H01J *43/04, 27/02***
**U.S. Cl. 313—362.1** **11 Claims**



1. An ion-electron source, comprising:
a substantially straight tubular electron multiplier channel having an output aperture therein for ejecting ion-current formed therein;
inlet means for pressurizing the interior of said channel with a gas to a predetermined pressure; and
voltage polarization means for biasing said electron multiplier;
said channel including a feedback emitting region for intercepting some ions traveling a trajectory generally toward said aperture and emitting secondary electrons in response to ion interception, the intercepted ions and secondary electrons providing sufficient ion feedback to operate said electron multiplier in a self-sustained cascade mode.

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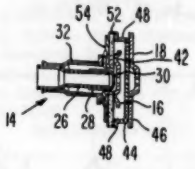
**4,298,818**

## ELECTRON GUN

**Harry E. McCandless, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.**

**Filed Aug. 29, 1979, Ser. No. 70,738**
**Int. Cl.³ H01J *29/50***
**U.S. Cl. 313—417** **4 Claims**




1. In a multi-beam electron gun for use in a cathode-ray tube, said gun including a plurality of cathode assemblies and at least two spaced successive electrodes having aligned apertures therein for passage of a plurality of electron beams, the improvement comprising,
said cathode assemblies and the two electrodes being individually attached to a single ceramic member, said ceramic member being the sole supporting interconnection within said gun between said cathode assemblies and two electrodes, said two electrodes being attached to one surface of said ceramic member and the cathode assemblies being attached to an opposite surface of said ceramic member.

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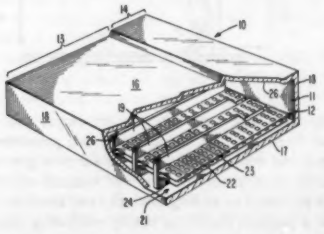
**4,298,819**

## BEAM CLEAN UP STRUCTURE FOR FLAT PANEL DISPLAY DEVICES

**Thomas L. Credelle, Plainsboro, and Robert A. Gange, Belle Mead, both of N.J., assignors to RCA Corporation, New York, N.Y.**

**Filed Mar. 28, 1980, Ser. No. 135,124**
**Int. Cl.³ H01J *29/08***
**U.S. Cl. 313—422** **16 Claims**




1. In a display device including two parallel spaced guide meshes forming a space between said guide meshes, said

meshes having a plurality of apertures arranged in columns longitudinally along said meshes and rows transversely across said meshes, said columns of apertures serving as guide paths for propagating electron beams between said meshes in said space, the improvement comprising:

electron beam clean up means for confining the cross section of said electron beams to maximum dimensions, said clean up means including a plurality of projections formed in said guide meshes between said rows of apertures and protruding into said space between said guide meshes.

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**4,298,820**

## LUMINESCENT SCREEN

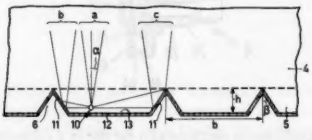
**Piet F. Bongers; Maurits W. van Tol, and John M. Robertson, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Jun. 18, 1979, Ser. No. 49,993**

**Claims priority, application Netherlands, Jun. 26, 1978, 7806828**

**Int. Cl.³ H01J *29/10***

**U.S. Cl. 313—463** **8 Claims**




1. A luminescent screen comprising a substrate having a luminescent layer of a monocrystalline structure said layer including at least one activator, characterized in that the activated layer and the substrate together constitute a single self-supporting monocrystalline body, the activated layer being provided with a pattern of V-shaped grooves.

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**4,298,821**

## ELECTRON TUBE WITH PARTICLE TRAP INTEGRAL WITH ENVELOPE WALL

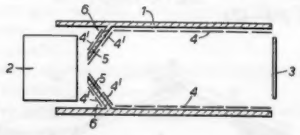
**Eric D. Hendry, Chelmsford, England, assignor to English Electric Valve Company, Chelmsford, England**

**Filed Sep. 12, 1979, Ser. No. 74,672**

**Claims priority, application United Kingdom, Sep. 15, 1978, 36969/78**

**Int. Cl.³ H01J *29/84, 29/88***

**U.S. Cl. 313—477 R** **3 Claims**




1. An electron tube having a tube envelope, and a target arranged to be scanned by an electron beam generated by an electron gun and wherein between said electron gun and said target a baffle member formed as a wall integral with the tube envelope is provided extending inwardly and towards said gun to provide a particle receiving cavity extending around the path of said electron beam from said gun to said target for retaining loose particles originating from said gun and which would otherwise fall upon said target when said tube is operated in a face-down position.

**4,298,822**

## FOLDED FLUORESCENT LAMP AND SOCKET

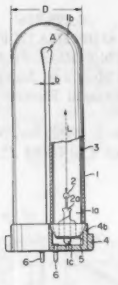
**Makoto Fukuda, Takatsuki, Japan, assignor to Matsushita Electronics Corporation, Osaka, Japan**

**Filed May 23, 1979, Ser. No. 41,789**

**Claims priority, application Japan, May 30, 1978, 53-65210**

**Int. Cl.³ H01J *61/42, 61/30, 61/02***

**U.S. Cl. 313—493** **1 Claim**




1. A fluorescent lamp comprising a U-shaped glass tube whose inside surface is coated with fluorescent materials and which is filed with mercury vapor and rare gas, two electrodes at the ends of said glass tube and a cap or base which bridges between said ends of said glass tube, said cap or base being formed with two cylindrical recesses each receiving an end of said U-shaped glass tube, said cap or base having terminal pins or prongs of G10q type, and a plurality of equiangularly spaced and axially extended ridges or projections extended from the peripheral wall of each of said cylindrical recesses for abutment with the end of said U-shaped glass tube, the width of said U-shaped glass tube being less than 60 mm; the distance between the legs of said U-shaped glass tube being greater than 0.5 mm, the ratio L/D being between 3 and 10, where L=the distance between said two electrodes and D=said width of said U-shaped glass tube; and the tube wall load being 0.05–0.10 w/cm$^2$.

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**4,298,823**

## FLUORESCENT DISPLAY DEVICE

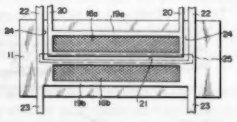
**Kishio Kawasaki, and Takao Kishino, both of Mobara, Japan, assignors to Futaba Denshi Kogyo K.K., Mobara, Japan**

**Filed Nov. 16, 1979, Ser. No. 94,985**

**Claims priority, application Japan, Nov. 28, 1978, 53-162666[U]**

**Int. Cl.³ H01J *63/04***

**U.S. Cl. 313—497** **3 Claims**




1. A fluorescent display device comprising:

a vacuum casing made up of a substrate and a front cover airtightly bonded together;

a pattern display section composed of a plurality of anodes

each coated with a phosphor layer on the upper surfaces thereof and disposed on said substrate;

a plurality of control electrodes electrically isolated one after another and mounted above said pattern display section, said control electrodes being secured to spacer frames and at least some of said control electrodes being arranged in an opposite relationship making edges of said spacer frames adjacent;

a filamentary cathode stretched above said control electrodes for emitting thermions to be selectively impinged on said anodes to effect luminous display of letters or figures; and

an elongated insulator mounted on at least two adjacent control electrodes along the opposed edges of said spacer frames, whereby each of the control electrodes is connected together at the opposed edges of said spacer frames by means of said insulator.

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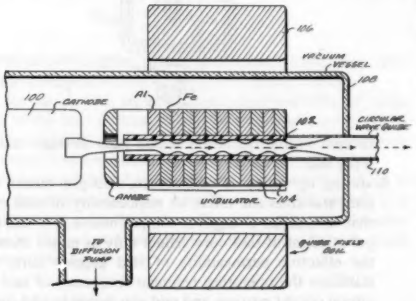
**4,298,824**

## MILLIMETER AND SUB-MILLIMETER RADIATION SOURCE

**John E. Walsh, Box 264, Bradford, Vt. 05033, assignor to Dartmouth College, Hanover, N.H. and John E. Walsh, a part interest**

**Filed Dec. 18, 1979, Ser. No. 104,737**
**Int. Cl.³ H01J *25/00***
**U.S. Cl. 315—4** **6 Claims**




1. A radiation source comprising:

electron means for producing a beam of electrons and directing said beam along a linear path;

dielectric material having a dielectric constant less than 4 mounted in proximity to said path;

means for providing Ubitron type of interaction oscillatory velocity modulation to said beam along said path for providing millimeter and sub-millimeter wavelength radiation.

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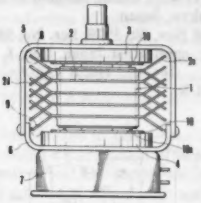
**4,298,825**

## MAGNETRON DEVICE

**Takahiro Daikoku, Ibaraki, and Tomokatsu Oguro, Mobara, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Jun. 13, 1979, Ser. No. 48,063**
**Claims priority, application Japan, Jun. 16, 1978, 53-81879[U]**
**Int. Cl.³ H01J *25/50***
**U.S. Cl. 315—39.51** **7 Claims**

1. In a magnetron device comprising a plurality of cooling fins stacked and secured to the periphery of a magnetron tube to extend in a direction substantially perpendicular to the axis of said tube and means for blasting cooling air passed through said cooling fins in a direction substantially perpendicular to said tube axis, the improvement wherein each of said cooling fins comprises a flat portion fitted to said tube and a plurality of tongue shaped pieces on the opposite sides of said flat portion, and alternate tongue shaped pieces on each side extend in different directions with respect to the plane of said flat portion so that said tongue shaped pieces of adjacent cooling fins are interdigitated to intersect with each other to define a plurality



of contiguous parallel passages aligned in the direction of air flow for enhancing turbulence.

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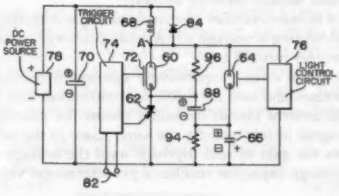
**4,298,826**

## AUTOMATIC FLASH UNIT

**Yasuo Nakayama, Tanashi, Japan, assignor to Morris Photo Ind. Co. Ltd., Kawajima, Japan**

**Filed Oct. 22, 1979, Ser. No. 87,469**
**Claims priority, application Japan, Oct. 27, 1978, 53-132247; Oct. 27, 1978, 53-132248**
**Int. Cl.³ H05B *41/32***
**U.S. Cl. 315—151** **9 Claims**




1. An automatic flash unit comprising:

a discharge lamp filled with xenon or like rare gas;

a first switching element connected in series with the discharge lamp for turning it ON and OFF;

a main capacitor for supplying electrical energy to the series circuit of the first switching element and the discharge lamp via an impedance element which is a resistor or inductance;

a DC power source for charging the main capacitor;

a series circuit composed of a second switching element conducted by a light control signal from light control means and a commutation capacitor and connected in parallel with the series circuit of the discharge lamp and the first switching element; and

means for charging the commutation capacitor of the series circuit in a polarity different from that in which the main capacitor is charged;

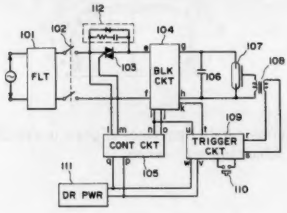
wherein stored charges of the commutation capacitor charged by the charging means are applied by the conduction of the second switching element to the first switching element to place it in a reverse biased condition, and wherein the charging means has the arrangement that an auxiliary commutation capacitor is adapted to be pre-charged by the DC power source in the same polarity as the main capacitor and is connected between the connection point of the discharge lamp and the first switching element and the connection point of the second switching element and the commutation capacitor, and that one part of stored charges of the auxiliary commutation capacitor is transferred by the conduction of the first switching element to the commutation capacitor.

**4,298,827**

## POWER SOURCE CIRCUIT FOR A FLASH DISCHARGE LAMP

**Yahei Nakajima, Himeji, Japan, assignor to Ushio Denki Kabushikikaisha, Tokyo, Japan**

**Filed Nov. 30, 1979, Ser. No. 98,990**
**Claims priority, application Japan, Dec. 1, 1978, 53-164567**
**Int. Cl.³ H05B *41/34***
**U.S. Cl. 315—241 R** **6 Claims**




1. A power source circuit for a flash discharge lamp, comprising:

a power source;

a booster-rectifier circuit, having an input and an output;

a thyristor operatively connected to the input of said booster-rectifier circuit and operatively connected to said power source;

a discharge capacitor operatively connected to the output of said booster-rectifier circuit;

said booster-rectifier circuit including a detecting means for detecting a voltage across said discharge capacitor;

a trigger circuit; and

a control circuit, operatively connected to said detecting means and said thyristor, for controlling said thyristor;

said control circuit including means for providing an AC signal of substantially the same phase as the power source to the gate of said thyristor until the voltage of said discharge capacitor reaches a predetermined valve.

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**4,298,828**

## HIGH FREQUENCY ELECTRODELESS LAMP HAVING A GAPPED MAGNETIC CORE AND METHOD

**James W. H. Justice, Murrysville, and Martin D. Nahemow, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.**

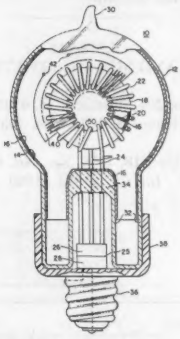
**Continuation-in-part of Ser. No. 13,594, Feb. 21, 1979, abandoned, which is a continuation-in-part of Ser. No. 883,544, Mar. 6, 1978, abandoned. This application Aug. 8, 1979, Ser. No. 64,935**
**Int. Cl.³ H05B *41/16, 41/24***
**U.S. Cl. 315—248** **29 Claims**

1. An electrodeless discharge device designed to operate with a rated power consumption when energized with predetermined radio frequency energy as generated by a radio-frequency power source, said radio-frequency power source having an output portion comprising a tuned circuit having a resonant frequency which approximates said predetermined radio frequency at which said device is to be operated, said device comprising:

a. a sealed light-transmitting globular-shaped envelope of predetermined dimensions; a discharge-sustaining medium within said envelope; and a layer comprising phosphor material carried on the interior surface of said envelope;

b. a core at least partially contained within and operatively positioned within said envelope, said core principally comprising magnetic material of high permeability and having a looped configuration of predetermined dimensions and also having predetermined cross-sectional dimensions, and said core also including narrow gap means comprising low-permeability substance traversing the cross section of said core; and a winding having a predetermined number of turns wrapped about said core;

c. lead-in members connecting to said winding for connection to said radio-frequency power source; said core comprising a part of said tuned circuit output portion of said radio-frequency power source, and the magnetic permeability of said core constituting a principal variable factor which can cause the resonant frequency of said tuned circuit output portion to vary; and during operation of said device, the radio-frequency energy passed through said winding creates radio-frequency electromagnetic fields through and about said core and within said envelope to excite said discharge-sustaining medium to emit short wavelength radiations, and said layer comprising phosphor is responsive to said short wavelength radiations



to emit visible radiations which pass through said envelope; and

d. during operation of said device, said gap means in said core stabilizes the effective permeability of said core so that substantial changes in the permeability of the principal material of siad core reflect only as minor changes in the effective permeability of said gapped core, which stabilizes the operating resonant frequency of said tuned circuit output portion; and said gap means in said core also substantially increases the Q of said tuned circuit, as compared to the Q of an otherwise similar tuned circuit which incorporates a core formed entirely of said principal core material, to substantially increase the selectivity of said tuned circuit output portion to suppress output harmonics of said resonant frequency of said tuned circuit output portion.

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**4,298,829**

## POWER SUPPLY AND DEFLECTION CIRCUIT WITH RASTER SIZE COMPENSATION

**David W. Luz, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.**

**Filed Feb. 8, 1980, Ser. No. 119,990**
**Int. Cl.³ H01J *29/70***
**U.S. Cl. 315—408** **16 Claims**

1. A power supply and deflection circuit with raster size compensation, comprising:

a deflection winding;

a deflection generator coupled to said deflection winding for periodically applying a trace voltage to said deflection winding to produce scanning current in said deflection winding and for periodically generating a retrace pulse voltage across said deflection winding;

a flyback transformer with a winding coupled to said deflection generator for developing retrace pulse voltages;

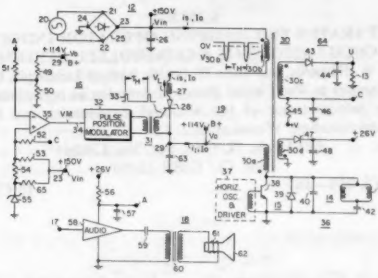
a high voltage circuit coupled to a high voltage winding of said flyback transformer for developing an ultor accelerating

potential from the retrace pulse voltage developed across said high voltage winding;

a load circuit coupled to a winding of said flyback transformer;

a source of supply voltage for developing said trace voltage and for providing energy to said load circuit;

a controllable switch coupled to said source and to a winding of said flyback transformer other than said high voltage winding for controlling the magnitude of said trace voltage, said high voltage and load circuits drawing current from said source through said other flyback transformer winding such that variations of a given sense in said other flyback transformer winding current produce same sense variations in retrace pulse voltage amplitude;




a control circuit coupled to said controllable switch for varying the conduction time of said controllable switch;

means for developing an input signal representative of variations in the load current drawn by said load circuit, variations in said load current producing a same sense variation in said other flyback transformer winding current; and

means for applying said input signal to said control circuit to vary the conduction time of said controllable switch in a manner that varies the trace voltage magnitude in the same sense as that of said variations in said other flyback transformer winding current.

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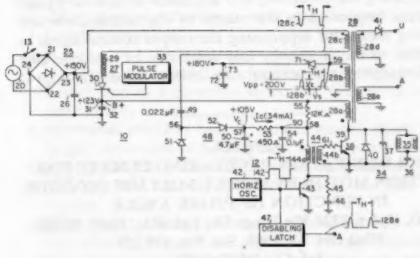
**4,298,830**

## HORIZONTAL DEFLECTION GENERATOR AND DRIVER CIRCUIT

**Peter R. Knight, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.**

**Filed Nov. 30, 1979, Ser. No. 98,923**
**Int. Cl.³ H01J** *29/70*
**U.S. Cl. 315—411** **6 Claims**




1. A deflection generator and driver circuit, comprising:

a deflection winding;

trace switching means responsive to a deflection rate switching signal for generating scanning current in said deflection winding;

a driver stage responsive to a deflection rate control signal for developing said deflection rate switching signal;

means coupled to said driver stage for applying said deflection rate switching signal to said trace switching means to control the conduction of said trace switching means;

a source of deflection rate alternating current voltage developing a first polarity pulse voltage during a retrace interval of each deflection cycle and an opposite polarity trace voltage during a trace interval of each deflection cycle; and

DC supply means coupled to said source and to said driver stage for providing a load current to said driver stage at an output terminal of said DC supply means, including

a first capacitor series coupled with said source;

a first rectifier coupled to said first capacitor for charging said first capacitor from said trace voltage during said trace interval;

a second capacitor coupled to said output terminal, and

a second rectifier coupled to said source and to said second capacitor for applying during said retrace interval the trace interval voltage developed across said first capacitor in series with said pulse voltage to develop a direct current supply across said second capacitor, said pulse voltage charging said first capacitor during said retrace interval to a voltage polarity opposite that established across said first capacitor during said trace interval and to a voltage magnitude that develops a direct current supply voltage that is of a substantially lesser magnitude than that of said pulse voltage.

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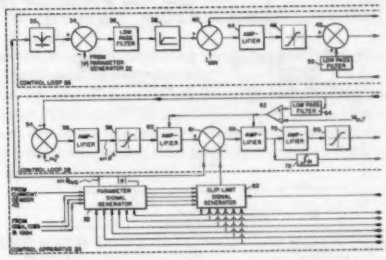
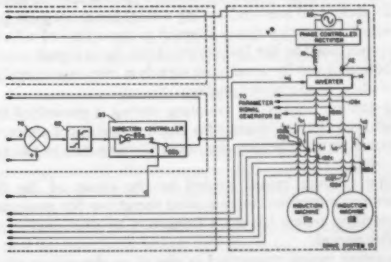
**4,298,831**

## METHOD AND APPARATUS FOR OPERATING A PLURALITY OF PARALLEL COUPLED, ARBITRARILY LOADED INDUCTION MACHINES FROM A SINGLE CONTROLLED CURRENT INVERTER

**Paul M. Espelage, Salem, Va., and John D. D'Atre, Ballston Lake, N.Y., assignors to General Electric Company, Schenectady, N.Y.**

**Filed Mar. 24, 1980, Ser. No. 132,783**
**Int. Cl.³ H02P** *1/54, 5/46, 1/24, 5/28*
**U.S. Cl. 318—112** **14 Claims**





1. For use with an inverter-induction machine drive system

comprised of a direct current excited-inverter and a plurality of arbitrarily loaded induction machines, the machines coupled in parallel across the output of said inverter and each machine receiving variable amplitude, variable frequency alternating current from said inverter, an improved control apparatus for regulating inverter output current amplitude and frequency in response to operator commands, comprising:

circuit means coupled to said inverter and to each of said machines, said circuit means processing inverter output voltage and machine stator currents to produce a first signal varying in accordance with the average machine phase angle and a second signal varying in accordance with the slip frequency of the most heavily loaded one of said machines;

a first control loop coupled to said circuit means and said inverter, said first control loop being responsive to operator commands and regulating the amplitude of inverter output current by feedback control in response to the average machine phase angle relationship magnitudes; and

a second control loop coupled to said circuit means and said inverter, said second control loop being responsive to operator commands and regulating the frequency of inverter output current by feedback control in response to the average machine phase angle and the slip frequency of the most heavily loaded one of said induction machines to assure that the most heavily loaded one of said induction machines has sufficient flux, to remain synchronized to said inverter thereby reducing the liklihood of machine pull-out and inverter instability.

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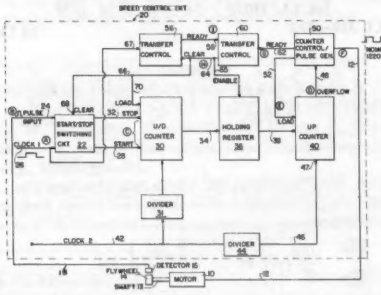
## 4,298,832
## DIGITAL MOTOR SPEED CONTROLLER

**Robert H. Acker, Packanack Lake; William C. Wessling, Sparta; Arnold J. Brand, Parsippany, and Bob N. Naydan, Wyckoff, all of N.J., assignors to The Singer Company, Little Falls, N.J.**

**Filed Mar. 14, 1980, Ser. No. 130,279**
**Int. Cl.³ H02P** *5/16*
**U.S. Cl. 318—318** **5 Claims**




1. A gyroscope motor speed control system comprising:

a two-axis gyroscope motor having a gyro wheel for sensing tilt about two axes and having a shaft for driving the gyro wheel, said motor being adapted to have a speed which is proportional to the frequency of the input signal;

detecting means for producing signals in response to cyclical rotation of the motor shaft;

first counter means for counting during a period of time between the beginning of a clock signal and a detecting means signal whereby the count corresponds to the time period;

second counter means loaded by the count of the first counter means and incremented therefrom for generating overflow pulses having a frequency proportional to the time period;

generating means connected in circuit to the output of the second counter means for driving the motor, whereby the time period is urged to a null thus maintaining constant motor speed and phase with respect to a reference;

register means connected between the first and second counter means for storing the count of the first counter means during a clock cycle and transferring the count to the second counter means at the end of a clock cycle;

switching means connected between the detecting means and the first counting means for initiating a count therein at the leading edge of the clock signal and terminating the count upon the occurrence of the detecting means signal; and

transfer means connected to the output of the second counter means for controlling the transfer of the count to the second counter means.

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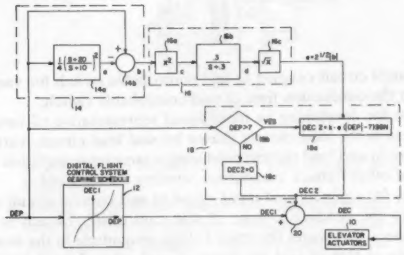
## 4,298,833
## APPARATUS FOR DAMPING OPERATOR INDUCED OSCILLATIONS OF A CONTROLLED SYSTEM

**John W. Edwards, and John W. Smith, both of Lancaster, Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.**

**Filed Feb. 29, 1980, Ser. No. 126,064**
**Int. Cl.³ G05B** *13/00*
**U.S. Cl. 318—561** **10 Claims**




1. In a control system having linear and quadratic terms in its control transfer function of the form $DEC=(A+B|DEP|)\text{-}DEP$, where A is a constant less than 1, B is a constant smaller than A by an order of magnitude, DEP is an operator controlled input signal and DEC is the output control signal of the system, a nonlinear filter system for modifying the output control signal DEC as a function of the frequency and amplitude of the operator controlled input signal DEP to suppress oscillations in the output control signal comprised of means for producing a signal the amplitude of which is a frequency and amplitude estimation of the input signal, means for rectifying and smoothing said frequency and amplitude estimation signal, and means responsive to the output of the rectification and smoothing means for suppressing the output control signal in proportion to the frequency and amplitude of said operator controlled input signal without rate limiting the control signal output.

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## 4,298,834
## POWER DISSIPATION REGULATING CIRCUIT FOR INDUCTION MOTOR BY SUPPLY VOLTAGE CONTROL IN FUNCTION OF PHASE ANGLE

**Gerald D. Opfer, 8724 Via Diego Ct., Lakeside, Calif. 92040**

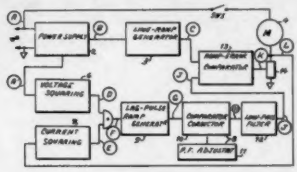
**Filed Oct. 17, 1980, Ser. No. 198,201**
**Int. Cl.³ H02P** *7/62*
**U.S. Cl. 318—729** **7 Claims**

1. In a device for maintaining the power factor of an induction motor to a desirable value regardless of load and line voltage variations by switching off the voltage applied to the motor during each cycle for a period of time in function of an error signal, a circuit for generating said error signal in re-

sponse to the phase lag between the applied voltage and the current drawn by the motor which comprises:

means for generating a train of pulses having a width proportional to said phase lag;

means for reducing said width by a predetermined period wherein said means for reducing comprises for each pulse:



means for generating a ramp voltage beginning with the leading edge of said pulse;

means for the delaying said leading edge until said ramp voltage reaches a predetermined voltage value corresponding to said predetermined period; and

means for developing a voltage level proportional to the reduced width of said pulses.

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**4,298,835**

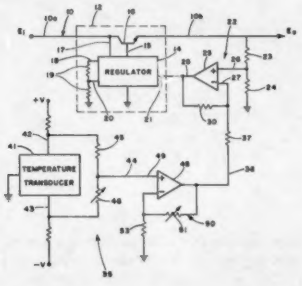
## VOLTAGE REGULATOR WITH TEMPERATURE DEPENDENT OUTPUT

**Don H. Rowe, Portola Valley, Calif., assignor to GTE Products Corporation, Stamford, Conn.**

**Filed Aug. 27, 1979, Ser. No. 70,078**

**Int. Cl.³ G05F *1/46***

**U.S. Cl. 323—281** **1 Claim**



1. A circuit for regulating voltage on a power supply output line comprising

a voltage regulator having an input and an output connected to said output line.

said regulator being adapted to derive an error voltage at said regulator output for changing the voltages on said output line in a direction to reduce said error voltage substantially to zero,

a differential amplifier having first and second inputs and an output connected to said input of said regulator,

said amplifier being adapted to algebraically add voltages at said first and second inputs to produce the sum at the output,

said first input said amplifier being connected to said output line whereby to sense the regulated voltage thereon,

a temperature transducer having an output and being responsive to ambient temperature to produce a voltage at said transducer output characterized by an absolute voltage change per degree change of temperature, and

means to connect said transducer output to the second input of said amplifier comprising

an operational amplifier having a first input connected to the output of said transducer and a second input and an output,

a feedback loop connected between said operational amplifier output and said second input of said operational amplifier and

a variable resistor connected in said feedback loop, the resistive value of said variable resistor being determinative of the value of the amplification factor of said operational amplifier whereby to set the slope of the temperature-voltage characteristic of the circuit.

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**4,298,836**

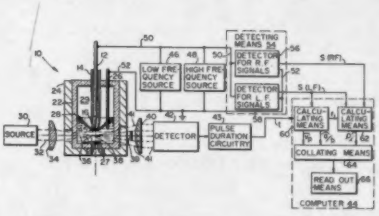
## PARTICLE SHAPE DETERMINATION

**Michael R. Groves, Miami, and Wallace H. Coulter, Miami Springs, both of Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.**

**Filed Nov. 23, 1979, Ser. No. 96,945**

**Int. Cl.³ G01N *27/00***

**U.S. Cl. 324—71 CP** **14 Claims**



1. A particle scanning apparatus including an orifice for electrical impedance measurements of individual particles suspended in a liquid stream, focusing means for hydrodynamically focusing the stream of particles so the particles proceed along a predetermined trajectory through the orifice, first electrical current means for providing a low frequency electrical current through said orifice to produce an electrical first impedance signal for each particle, second electrical current means for providing a high frequency electrical current through said orifice to produce an electrical second impedance signal for each particle, the particle scanning apparatus comprising:

detection means for producing a length signal representative of the length of each particle;

means for correlating said length signal, said first impedance signal and said second impedance signal for each particle;

whereby the producing and correlating of said signals provides all the parameters required for the determination of the internal resistivity of each particle.

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**4,298,837**

## HAND HELD TESTING DEVICE FOR MEASURING DIFFERENT ELECTRICAL QUANTITIES

**Manfred Koslar, Rheda-Wiedenbrueck, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed Apr. 1, 1980, Ser. No. 136,360**

**Claims priority, application Fed. Rep. of Germany, Apr. 11, 1979, 2914761**

**Int. Cl.³ G01R *31/02***

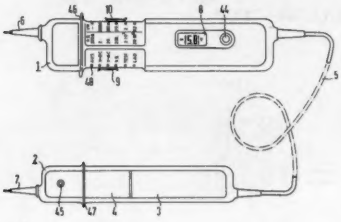
**U.S. Cl. 324—72.5** **12 Claims**

1. A hand held testing device having means for selecting independently one of several functions and one of several ranges, respectively, for measuring different electrical quantities within a wide range of magnitudes, comprising in combination:

(a) a first handle, a second handle and a cable connecting the two handles, each of said handles being provided with a hollow body for accomodating electrical units and with a test prong for contacting a respective measuring point;

(b) a function selecting switch and a range selecting switch both arranged on said first handle; a first printed circuit board assembly mounted within the body of said first handle and carrying two separate groups of contacting areas assigned to said function selecting switch and to said range selecting switch, respectively; each of said switches further having a switch frame and movable contact elements arranged in parallel thereon and being movable in common and stepwise, between different selector positions, in the direction of the long axis of said first handle, and when in a selector position, being in close contact with respective neighboring contact areas; each of said switch frames having a finger grip element extending through said first handle body at opposite sides for manual operation of the respective switch;

(c) two selector areas arranged side by side and between the two finger grip elements on one surface of said first handle, the first selector area marking selector positions of said function selecting switch and the second selector area marking selector positions of said range selecting switch;



(d) a semiconductor display device mounted in said body of said first handle, and having a display area arranged to be visible through the body of said first handle on the same side of said first handle as said selector areas;

(e) a second printed circuit board assembly mounted aside said first printed circuit board assembly in said body of said first handle and electrically connected to said first printed circuit board assembly, said second printed circuit board assembly carrying measurement processing circuit arrangements on one surface and means for connecting the display device to outputs of said measurement processing circuit arrangements arranged on the opposite surface; and

(f) a chargable voltage source unit and means for charging the same built into said second handle.

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**4,298,838**

## TRANSFORMER DEVICE

**Masahiko Akamatsu, Amagasaki, and Ryohei Uchida, Himeji, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Division of Ser. No. 759,192, Jan. 13, 1977, abandoned. This application Jan. 31, 1978, Ser. No. 873,950**

**Claims priority, application Japan, Jan. 14, 1976, 51-3660; Jan. 14, 1976, 51-3669; Apr. 9, 1976, 51-40676**

**Int. Cl.**[3] **G01R** *33/00;* **H03K** *7/00;* **H01H** *85/22*

**U.S. Cl. 324—117 R** **3 Claims**

1. A current transformer device comprising:

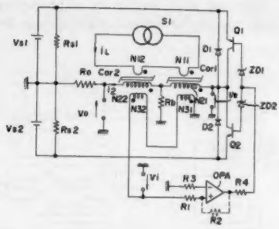
two magnetic cores excited by one exciting current and maintained in the non-saturated state;

an input winding wound on at least one of the magnetic cores;

at least one exciting winding wound on the two magnetic cores and passing the exciting current;

detecting means including detecting windings wound on said magnetic cores for detecting a magnetic flux change rate of at least one of the magnetic cores;

exciting means connected to said at least one exciting winding and driven by an output of said detecting means for switching the polarity of a voltage applied to the exciting winding based on the output of the detecting means to maintain said cores in the non-saturated state; and



means for obtaining the current value passing through the exciting winding circuit.

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**4,298,839**

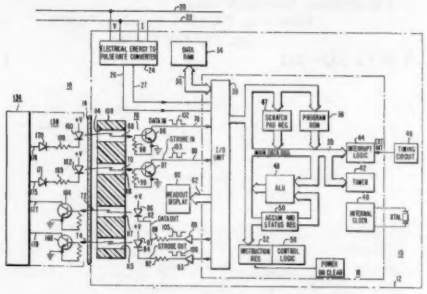
## PROGRAMMABLE AC ELECTRIC ENERGY METER HAVING RADIATION RESPONSIVE EXTERNAL DATA INTERFACE

**Paul M. Johnston, Raleigh, N.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Mar. 31, 1978, Ser. No. 891,997**

**Int. Cl.**[3] **G01R** *11/04;* **H04B** *9/00;* **G08C** *9/06*

**U.S. Cl. 324—157** **11 Claims**



1. An electric energy meter including a programmable time based measuring system for totalizing measured parameters of electric energy usage, said meter interactively communicating with a programmer/reader unit by way of binary coded light radiations, said meter comprising:

a sealed enclosure including a cup-shaped cover wholly enclosing said measuring system, said cover including an optically transparent portion thereof for allowing the transmission of said light radiations through said enclosure, said cover further including integral index means having a fixed position thereat for orienting said programmer/reader unit;

said measuring system including a metering sequence logic control circuit having a data input/output unit and a read/write data memory means, said memory means electronically storing metering data and program data and being connected to said input/output unit so as to transfer data therebetween;

radiation sensitive data interface means including a first light radiation emitter and a first light radiation sensor for establishing communications with said programmer/reader unit, and including a second light radiation emitter cooperating with both said first light radiation sensor and emitter so as to interactively send data at an arbitrary rate, and further including a second light radiation sensor cooperating with both said first light radiation emitter and

sensor so as to interactively receive data at an arbitrary rate; and

radiation coupling means providing optically isolated light radiation paths between said transparent portion of said cover and said data interface means, said radiation coupling means having a predetermined aligned position relative to said index means such that said radiation sensitive data interface means is aligned with said programmer/reader unit thereby facilitating interactive bi-directional communication between said programmer/reader unit and said data memory means.

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**4,298,840**

## PLURAL ELECTRODE METHOD AND MEANS FOR WATER BOTTOM LOGGING

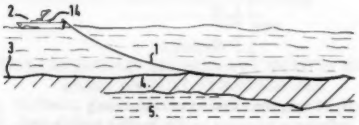
**Jürgen H. Bischoff, and Joachim A. Sebulke, both of Berlin, Fed. Rep. of Germany, assignors to Shell Internationale Research Maatschappij B.V., Netherlands**

**Filed May 7, 1979, Ser. No. 36,681**

**Claims priority, application United Kingdom, May 19, 1978, 20741/78**

**Int. Cl.³ G01V** *3/06, 3/15*

**U.S. Cl. 324—365** **14 Claims**




6. Means for water bottom logging comprising a flexible cable with insulated electrical leads, and carrying electrodes on the outer wall thereof that are electrically connected to at least some of the leads, said electrodes being arranged along the cable in a configuration consisting of at least two non-overlapping groups of electrodes, a first group of these electrodes being current supply electrodes, and the electrodes of the other group or groups being measuring electrodes for measuring potential differences between at least two pairs of electrodes, wherein a fixed ratio exists between the distance between the electrodes of each pair of measuring electrodes and the distance between said pair of measuring electrodes and the first group of electrodes, and wherein further the pairs of measuring electrodes adjoin each other such that each two pairs have one measuring electrode in common.

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**4,298,841**

## SIGNAL ENVELOPE DETECTING SYSTEM

**Milton Dishal, Clifton, N.J., assignor to International Telephone and Telegraph Corporation, New York, N.Y.**

**Filed Sep. 14, 1979, Ser. No. 75,616**

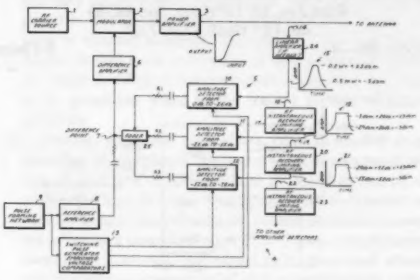
**Int. Cl.³ H03K** *5/24, 5/153*

**U.S. Cl. 328—117** **16 Claims**

1. A signal envelope detecting system for detecting the envelope of a signal requiring accurate reproduction over a large dynamic range comprising:

a source of said signal;

a plurality of amplitude detectors coupled to said source, each of said plurality of detectors being responsive to a control signal, said control signal rendering each of said plurality of detectors operative one at a time to detect the amplitude of said signal in a different amplitude range of said signal and holding the others of said plurality of detectors not rendered operative inoperative; and



means coupled to the output of said plurality of detectors to receive the output signals therefrom.

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**4,298,842**

## HETEROPOLAR MACHINE FOR DEMODULATING POLYPHASE VOLTAGES INTERFERING AMONG THEMSELVES

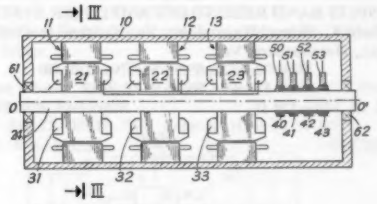
**Gérard O'Mahony, 95 rue de Versailles, 22410 Ville d'Avray, France**

**Filed Jun. 12, 1979, Ser. No. 47,757**

**Claims priority, application France, Jun. 14, 1978, 78 17836**

**Int. Cl.³ H03D** *3/18*

**U.S. Cl. 329—50** **22 Claims**




1. A demodulator for demodulating polyphase voltages at n phases interfering among themselves and which create a system of polyphase pseudo-sinusoidal voltages modulated in amplitude to a pulsation $\epsilon$, in order to obtain a system of polyphase voltages of pulsation $\epsilon$, the demodulator comprising n polyphase synchronous heteropolar rotating machines including:

(a) n stators at n phases fed by n systems of polyphase pseudo-sinusoidal voltages modulated in amplitude to a pulsation $\epsilon$, and of the form:

$$U_{ip} = U_{\phi}\sin\left(\omega_1 t + \frac{2\pi p}{n}\right) + U_{\phi}\sin\left(\omega_2 t + \frac{2\pi(i+p)}{n}\right)$$

in which i represents the group index of the voltages and varies from 1 to n, and p represents the index of phase in the group of voltages and varies from 1 to n,

(b) n wound rotors mounted within said n stators and each including magnetic circuits made up of a low loss magnetic material and capable of transmitting an alternating magnetic flux without damping, each rotor having the same number of poles as a corresponding stator, and

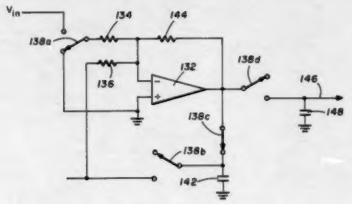
(c) means for collecting from the n rotors, n systems of polyphase voltages of pulsation $\epsilon$.

**4,298,843**

## STABILIZED DC AMPLIFIER

**John M. Nixon, Mineral Wells, Tex., assignor to Edo-Aire Mitchell, Mineral Wells, Tex.**

**Filed Jun. 15, 1979, Ser. No. 48,789**
**Int. Cl.³ H03F** *1/02, 1/26*
**U.S. Cl. 330—9** **9 Claims**




1. A stabilized DC amplifier circuit, comprising:
an amplifier,
mixing means including first and second resistors connected to the input of said amplifier,
sample and hold means, and
switching means having a first position for connecting: (1) said first resistor to a reference source, and (2) the output of said amplifier to said sample and hold means; and having a second position for connecting: (1 ) said first resistor to the input signal, (2) said sample and hold means to the second resistor, and (3) disconnecting said sample and hold means from the output of said amplifier.

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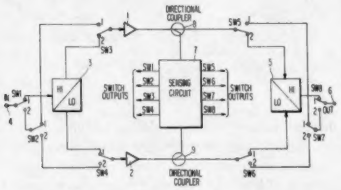
**4,298,844**

## SPLIT-BAND REDUNDANT AMPLIFIER SYSTEM

**Richard L. Shimp, Waynesboro, Va., assignor to ComSonics, Inc., Harrisonburg, Va.**

**Filed Mar. 21, 1980, Ser. No. 131,940**
**Int. Cl.³ H03F** *3/68, 1/18*
**U.S. Cl. 330—124 D** **3 Claims**




1. A split-band, redundant amplifier system having an input terminal and an output terminal comprising:
at least two identical amplifiers each having an input and an output and capable of amplifying signals having frequencies within a predetermined pass band,
first filter means having an input and at least two outputs for receiving signals at its input and dividing those signals into at least two contiguous split-bands within said predetermined pass band at its at least two outputs,
second filter means having at least two inputs and an output for receiving signals in said at least two contiguous split-bands and combining those signals at its output,
switching means connected to said at least two identical amplifiers and said first and second filter means for selectively connecting said input terminal to the input of said first filter means or one of said at least two identical amplifiers and for selectively connecting said output terminal to the output of said second filter means or one of said at least two identical amplifiers, said input terminal normally being connected to the input of said first filter means and said output terminal normally being connected to the output of said second filter means, and
sensing means connected to the outputs of each of said at least two identical amplifiers for detecting when an amplifier becomes inoperative and for controlling said switching means to disconnect an inoperative amplifier from said first and second filter means and to connect an operative amplifier to said input and output terminals.

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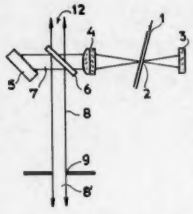
**4,298,845**

## DYE LASERS

**Jean-Pierre Laude, St. Cyr la Riviere, France, assignor to Instruments S.A., Paris, France**

**Filed Oct. 10, 1979, Ser. No. 83,533**
**Claims priority, application France, Oct. 18, 1978, 78 29690**
**Int. Cl.³ H01S** *3/05*
**U.S. Cl. 331—94.5 C** **3 Claims**




1. In a dye laser, a combination comprising
means defining a resonant cavity having two ends;
a reflecting mirror closing one of said ends, and an angular dispersive system in form of a grating closing the other of said ends;
means for passing a stream of dye as the active medium through said cavity;
a beam separating system intermediate said two ends for extracting the main laser beam from the cavity in two opposite directions, the part of the beam which is extracted in one of the directions being a useful beam part and being directed from said angular dispersive system towards a system for application, and the part of the beam which is extracted in the other direction being a stray useless beam part;
aperture means in the path of said useful beam part within or without said cavity for isolating one wavelength from said useful beam part; and
a mirror for recycling said stray useless beam part and returning the same towards said angular dispersive system in parallelism with said main laser beam.

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**4,298,846**

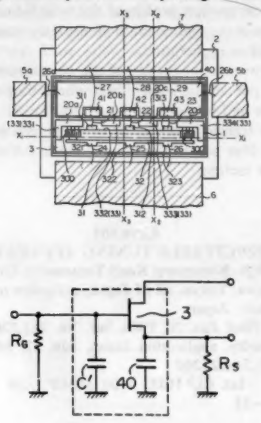
## SEMICONDUCTOR DEVICE

**Yutaka Hirano, Atsugi; Nobutoshi Fukuden, Yokohama, and Toshiaki Saito, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan**

**Filed Mar. 10, 1980, Ser. No. 128,655**
**Claims priority, application Japan, Mar. 10, 1979, 54-30994**
**Int. Cl.³ H03H** *7/38*
**U.S. Cl. 333—32** **36 Claims**

1. A semiconductor device, assembled on a base, comprising:
a semiconductor chip having an input electrode and an output electrode;
an input lead connected to said input electrode;
an output lead connected to said output electrode; and

capacitors mounted between said input lead and said semiconductor chip, said capacitors comprising at least one capacitor for grounding high-frequency components and at least one capacitor for input-impedance matching.



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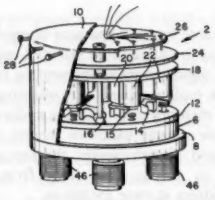
**4,298,847**

## MULTIPOSITION MICROWAVE SWITCH WITH INDEPENDENT TERMINATION

**Jerzy Hoffman, Santa Monica, Calif., assignor to Dynatech - UZ, Inc., Culver City, Calif.**

**Filed Apr. 21, 1980, Ser. No. 142,095**
**Int. Cl.³ H01P *1/12***
**U.S. Cl. 333—105** **3 Claims**



1. A multiposition microwave switch comprising:

(a) an essentially cylindrical metallic housing having a base and a cover plate with a cavity of uniform height disposed therein, said cavity comprising a central portion and a plurality of spaced radial portions of uniform width extending radially therefrom, each said radial portion having an associated leg shorter and of essentially equal uniform width extending acutely from a peripheral end thereof;

(b) a central coaxial connector of predetermined characteristic impedance mounted in said base with its inner conductor extending into and coaxially with said central portion;

(c) a plurality of peripheral coaxial connectors equal in number to no more than said plurality of radial portions, each said peripheral connector having a characteristic impedance equal to that of said central connector and being mounted in said base parallel to said central connector with its inner conductor extending into said peripheral end of one of said radial portions, at the juncture thereof with one end of said leg.

(d) a plurality of termination resistors equal in number to said plurality of peripheral connectors, each said resistor having an impedance equal to the characteristic impedance of said central connector and being mounted in said base and extending into the other end of said leg;

(e) a plurality of first conductors, equal in number to said plurality of peripheral connectors, each switchably disposed in one of said radial portions and of a length sufficient to connect said inner conductor of said central connector to said inner conductor of said peripheral connector when in a first of two switchable positions, and biased to be grounded when in the second of said switchable positions;

(f) a plurality of second conductors, equal in number to said plurality of peripheral connectors, each associated with one of said first conductors and disposed in one of said associated legs and of a length sufficient to connect said resistor to said inner conductor of said peripheral connector when in a complimentary first of two complimentary switchable positions, and biased to be grounded when in the complimentary second of said complimentary switchable positions;

(g) actuating means disposed above said housing for selectively switching said first conductors between said two switchable positions and said second conductors between said two complimentary switchable positions, each said first conductor being in its said first position when its associated said second conductor is in its said complimentary second position, and in its said second position when its associated said second conductor is in its said complimentary first position.

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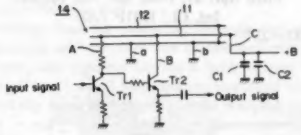
**4,298,848**

## FEEDING DEVICE FOR PRINTED CIRCUIT BOARD AND FEEDING ELEMENT

**Hideo Kurose, Zushi, Japan, assignor to Jelmax Co., Ltd., Tokyo, Japan**

**Filed Nov. 23, 1979, Ser. No. 96,913**
**Claims priority, application Japan, Dec. 22, 1978, 53-159437; Dec. 22, 1978, 53-159438**
**Int. Cl.³ H01P *7/01, 7/48;* H01G *4/32, 1/147***
**U.S. Cl. 333—181** **12 Claims**




1. A power feeding device for a printed circuit board comprising a distributed capacity element of a plural number of layers comprising:

a first conductive strip and a second conductive strip separated from each other by a low loss dielectric layer,

a plural number of leading-out terminals coupled to the first conductive strip of the distributed capacity element,

at least one leading-out terminal coupled to the second conductive strip of the distributed capacity element,

a power source connected to at least one leading-out terminal of said leading-out terminals of said first conductive strip,

an electrolytic capacitor connected to the power source, and

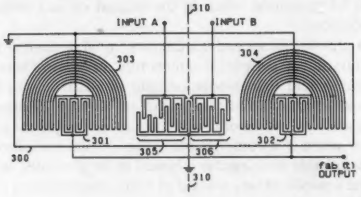
at least one non-polarized capacitor having a dissipation factor which is intermediate between that of said distributed capacity element and that of said electrolytic capacitor and being connected in parallel with the electrolytic capacitor,

said second conductive strip of the distributed capacity element being connected to a grounding circuit.

## 4,298,849
## DUALL-PASSBAND SURFACE ACOUSTIC WAVE FILTER

**Steven H. Arneson, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.**

**Filed Oct. 15, 1979, Ser. No. 85,081**
**Int. Cl.³ H03H** *9/64, 9/70, 9/76*
**U.S. Cl. 333—193** **18 Claims**

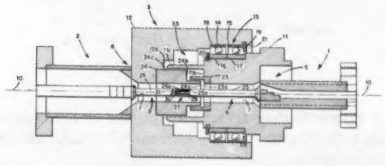



1. A surface acoustic wave (SAW) filter, comprising:
a piezoelectric substrate having at least one surface;
first and second transducer means disposed on the surface of the substrate at a predetermined distance from one another, the first and second transducer means each having a plurality of interdigital fingers; and
third and fourth non-identical transducer means disposed on the surface of the substrate between the first and second transducer means, the substrate having an axis located substantially equidistant between the first and second transducer means, and the third transducer means including a plurality of interdigital fingers disposed substantially to one side of the substrate axis, and the fourth transducer means including a plurality of interdigital fingers disposed substantially to the side opposite said one side of the substrate axis.

## 4,298,850
## DOUBLE RIDGE WAVEGUIDE ROTARY JOINT

**Andrew P. Pellerin, Salem, N.H., and Christ Theophile, Bedford, Mass., assignors to Microwave Antenna Systems and Technology Inc., Burlington, Mass.**

**Filed Apr. 21, 1980, Ser. No. 142,040**
**Int. Cl.³ H01P** *1/06*
**U.S. Cl. 333—257** **9 Claims**

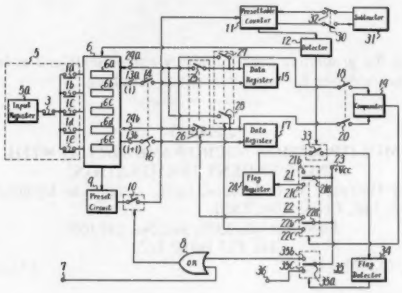


1. A rotary joint transmission line for conducting high frequency electric waves from an input transmission line section to an output transmission line section so that one line section can be mechanically rotated with respect to the other while the high frequency waves are conducted from the input to the output transmission line section comprising,
(a) one of said input and output sections is a ridge waveguide transmission line and both sections are oriented with their electrical axes on a common line,
(b) a coaxial line rotary joint having two parts, an input part and an output part, that fit together mechanically to define a coaxial transmission line at least one part being rotatable on an axis of rotation with respect to the other part coincident with the common line
(c) a transformer section of transmission line oriented with its electrical axis on said common line, rigidly connecting said ridge waveguide transmission line section to one of said parts of the rotary joint,
(d) the cross section profile of the transformer section and the ridge waveguide section where they connect being the same and in registration,
(e) the cross section profile of the transformer section and the one part of the rotary joint where they connect being the same and in registration,
(f) another transformer section of transmission line connecting the other part of the rotary joint to the other transmission line section.

## 4,298,851
## PRESETTABLE TUNING APPARATUS

**Hajime Shichijo, Kanagawa; Kenji Yamamoto, Chiba, and Kenichi Nakazawa, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan**

**Filed Jun. 20, 1980, Ser. No. 161,520**
**Claims priority, application Japan, Jun. 22, 1979, 54-79507; Sep. 20, 1979, 54-121340**
**Int. Cl.³ H03J** *5/08;* **H04B** *1/26*
**U.S. Cl. 334—11** **9 Claims**



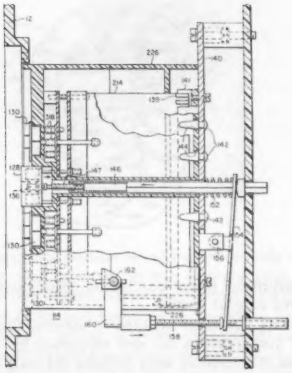

1. A presettable tuning apparatus comprising
tuning means for tuning to a selected radio frequency;
a source of digital signals representing radio frequencies to which the tuning apparatus is selectively tuned;
addressable memory means having a plurality of sequentially addressable storage locations therein for storing selected ones of said digital signals, the storage locations being arranged in a sequential order from lower-address to higher-address storage locations;
write-in means for selectively writing the digital signals from said source into selected ones of said storage locations in said memory means;
comparator means for comparing the digital signals stored in an adjacent pair of said sequentially addressable storage locations and providing a control signal indicating the relative values of the frequencies represented by the digital signals stored in said pair of storage locations; and
means for replacing the digital signals in said pair of storage locations with one another when the control signal of said comparator means indicates that the frequency represented by the digital signal stored in the lower-address one of said pair of storage locations is in a predetermined relationship to the frequency represented by the digital signal stored in the higher-address one thereof;
said presettable tuning apparatus thereby automatically rearranges the particular storage locations, in which digital signals corresponding to the selected radio frequencies are stored, so that the order of such radio frequencies corresponds to the sequential order of said storage locations, notwithstanding that such digital signals can be written at random into said addressable memory means.

4,298,852

## CIRCUIT BREAKER WITH INTERCHANGEABLE RATING ADJUSTER AND INTERLOCK MEANS

Alfred E. Maier, Chippewa; Alan B. Shimp, Monroeville, and David J. Uram, Penn Hills, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 853,940, Nov. 23, 1977, abandoned.
This application Aug. 21, 1979, Ser. No. 68,771
Int. Cl.[3] H01H *9/24, 33/48;* H02H *3/08*
U.S. Cl. 335—6 16 Claims



1. A circuit interrupter, comprising:

a housing;

a circuit breaker structure mounted within said housing and comprising a pair of separable contacts operable between open and closed positions to interrupt an electrical circuit releasable means operable from a latched to a tripped position to automatically open said contacts, and an operating mechanism for moving said contacts between open and closed positions;

trip means responsive to current flow through said contacts for actuating said releasable means from the latched to the tripped position to automatically open said contacts upon detection of overcurrent conditions, said trip means comprising a removable interchangeable rating adjuster for determining the level of overcurrent which will cause said trip means to operate; and

interlock means operable between a first position maintaining said releasable means in a tripped position and a second position allowing said releasable means to assume the latched position, said interlock means comprising first mechanical mating means separate from said housing and having a mechanical structure coordinated with the electrical characteristics of said trip means;

said rating adjuster comprising second mechanical mating means having a mechanical structure coordinated with the electrical characteristics of said rating adjuster and positioned to cooperate with said first mating means to operate said interlock means to said second position when a proper rating adjuster electrically compatible with said trip means is fully mounted upon said circuit interrupter;

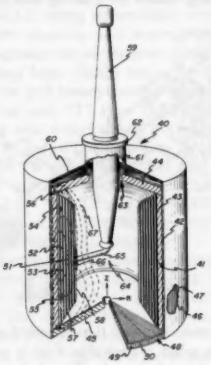
said first and second mating means cooperating to prevent operation of said interlock means to said second position when a rating adjuster not electrically compatible with said trip means is mounted upon said circuit interrupter.

4,298,853

## COMPACT HIGH VOLTAGE SHUNT REACTOR

Sanborn F. Philp, Pittsfield, Mass., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 27, 1980, Ser. No. 134,429
Int. Cl.[3] H01B *27/24*
U.S. Cl. 336—83 10 Claims



1. A high voltage shunt reactor comprising:

a cylindrical housing;

a magnetic shell comprising an annular ring and two generally circular end plates disposed within said housing; said annular ring comprising a plurality of radially extending, circumferentially adjacent laminations of magnetic material separated by layers of insulation and arranged in said annular ring within said housing; each of said end plates comprising a plurality of wedge-shaped members bonded together; and each of said wedge-shaped members comprising a plurality of laminations of magnetic material separated by layers of electrical insulation and bonded thereto to form said wedge-shaped members;

a coil of electrical conductor wound concentrically inside said shell and being hollow to form a nonmagnetic core disposed concentrically inside said coil and constituting a reactance volume; and

a high voltage bushing extending through one axial end of said housing and through one of said end plates and into said core; said bushing having a high voltage conductor passing therethrough and making electrical contact with the radially innermost layer of said winding.

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4,298,854

## COMBINED SWITCH AND FUSE HOLDER

James H. Andersen, 8045 E. Mercer Way, Mercer Island, Wash. 98040

Filed Jun. 12, 1980, Ser. No. 158,936
Int. Cl.[3] H01H *85/22*
U.S. Cl. 337—10 14 Claims

1. A combination cartridge fuse holder and switch comprising:

a first contact bar and a second contact bar having upper edges, and having first ends,

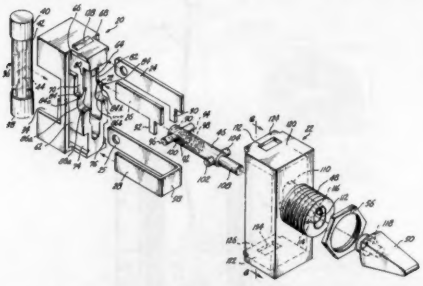
a first terminal and a second terminal,

body means defining a cartridge fuse receptacle and a pair of contact bar receiving means, said contact bar receiving means being spaced and constructed to receive said first and second contact bars so that the upper edges are spaced from each other and so that the upper edges lie substantially in a contact plane, said body means further defining a ramp inclined relative to said contact plane and intersecting said contact plane adjacent the first ends of said contact bars, said first and second terminals being mounted on said body means,

first connecting means for placing said first contact bar in electrical connection with said first terminal,

second connecting means for placing said second contact bar in electrical connection with one end of said fuse receptacle so that when a cartridge fuse is positioned in said receptacle, one end of said fuse is in electrical contact with said second contact bar,

third connecting means for placing said second terminal in



electrical connection with the other end of said fuse receptacle so that when a cartridge fuse is positioned in said receptacle, the other end of said fuse is in electrical contact with said second terminal, and

a contact pin, and holder means associated with the body means for moving said contact pin from said ramp on and off the upper edges of said contact bars to make and break contact between said first and second terminals when a cartridge fuse is positioned in said fuse receptacle.

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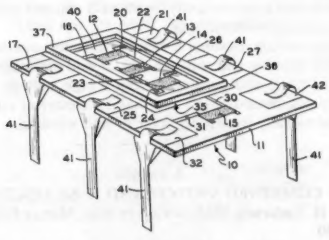
**4,298,855**

## CONDUCTIVE POLYMER FILM HUMIDITY SENSOR

**Frank S. Mills, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.**

**Filed Aug. 26, 1980, Ser. No. 181,507**
**Int. Cl.³ H01L *7/00***
**U.S. Cl. 338—35** **9 Claims**



1. A humidity sensor utilizing a conductive polymer film, including: self-supporting insulating substrate means which is unaffected by humidity; polymer film resistor means deposited upon said substrate means with said resistor means including a plurality of resistors; conductive connection means deposited upon said substrate means to interconnect said resistors in electric circuit means; said conductive connection means further including conductive areas connected to said resistors to form a plurality of terminals which are adapted to be used to connect said resistors in a bridge; hermetically impervious housing means mounted on and sealed to said substrate to form hermetically sealed chamber means; said chamber means enclosing all but one of said resistors in said chamber means; and said one unenclosed resistor being exposed to an ambient atmosphere whose humidity is to be measured by said unenclosed resistor varying in resistance value with the ambient humidity for comparison with a fixed dew point present in said sealed chamber means.

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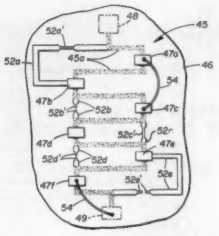
**4,298,856**

## METALLIZED RESISTOR AND METHODS OF MANUFACTURING AND ADJUSTING THE RESISTANCE OF SAME

**Donald W. Schuchardt, Glen Ellyn, Ill., assignor to Western Electric Company, Incorporated, New York, N.Y.**

**Filed Sep. 4, 1979, Ser. No. 72,371**
**Int. Cl.³ H01C *10/00***
**U.S. Cl. 338—195** **26 Claims**



1. An adjustable planar configured resistor comprising:

insulative support mean;

a relatively thin layer of resistive material formed in a desired configuration on, and supported by, said support means, said resistive layer defining the main body portion of said resistor, and having at least two conductive terminals connected to end regions thereof for completing electrical connections to said main body portion, said body portion comprising a thin-film layer of resistive material formed into a series of closely spaced, serially connected segments arranged in a serpentine configuration;

a plurality of conductive bonding pads formed as an integral part, and on the upper side, of respective discrete areas of said thin film resistor body portion between at least said two terminals thereof, said bonding pads being of sufficient cross section to allow conductive short-circuiting interconnections to be made between different selected pairs thereof, after fabrication of the resistor, whenever necessary to reduce the initial nominal value of resistance of said resistor to a lower desired value.

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**4,298,857**

## BRAKE WEAR INDICATOR SYSTEM

**Ronald F. Robins, Southend-on-Sea, and Jaan Lindre, Benfleet, both of England, assignors to Ford Motor Company, Dearborn, Mich.**

**Filed Feb. 1, 1980, Ser. No. 117,898**
**Int. Cl.³ B60T *17/22***
**U.S. Cl. 340—52 A** **6 Claims**

1. A motor vehicle brake warning system including a brake pad comprising:

a layer of friction material having a face operably engageable to a braking surface;

signal means operably embedded in said friction material for producing a first warning signal when the layer of friction material has abraded a predetermined amount and a second distinctive warning signal when the layer of friction material has further abraded beyond said predetermined amount;

said signal means comprising:

an electrical contact embedded in part into the layer of friction material such that said electrical contact comes in contact with an electrically grounded braking surface when said layer of friction material has abraded said

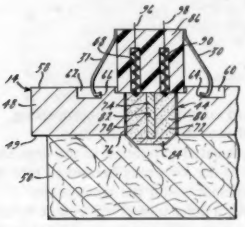
predetermined amount and said brake pad is applied to said braking surface;

an electric circuit connectable to said electrical contact and being actuated when said electrical contact comes into contact with said braking surface to produce said first signal;

said electrical contact comprising:

two terminal portions electrically insulated from each other;

a connecting portion electrically connecting the two terminal portions;



said connecting portion being located wholly embedded within said layer of friction material such that said connecting portion comes into contac. with the braking surface when said brake pad is applied to said braking surface after said layer of friction material has abraded a predetermined amount to produce said first signal, and said connecting portion becomes totally abraded when said layer of friction material has further abraded beyond said first predetermined amount to electrically disconnect said first terminal portion from said second terminal portion to produce said second signal.

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**4,298,858**

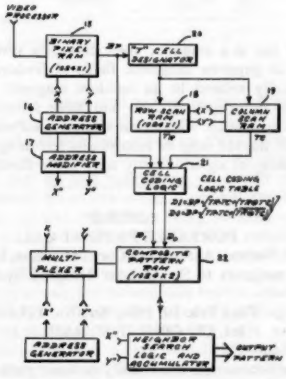
## METHOD AND APPARATUS FOR AUGMENTING BINARY PATTERNS

**John G. Romanski, Kingsville, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.**

**Filed Mar. 27, 1980, Ser. No. 134,718**

**Int. Cl.³ G06K *9/52***

**U.S. Cl. 340—146.3 MA** **4 Claims**



**1.** An augmented pattern generator for providing a pattern of binary PIXELS having discrete numerical values from a simple binary pattern of "1" and "0" type PIXELS arranged in rows and columns, said augmented pattern generator comprising

a binary pattern memory receiving simple binary pattern "1" and "0" type PIXEL data,

a "T" type PIXEL designator circuit locating and designating as "T" type PIXELS the PIXELS at the edge of each contiguous group of "1" type PIXELS in the rows and columns of the simple binary pattern, the simple binary pattern PIXELS being sequentially clocked out of said binary pattern memory and scanned by said "T" type PIXEL designator circuit by rows and columns,

a PIXEL coding logic circuit receiving "0" and "1" type PIXELS from said binary pattern memory and "T" type PIXELS from said "T" type PIXEL designator circuit and locating and designating "P" type PIXELS therefrom, said "P" type PIXELS being created by the Exclusive Or of the "1" type PIXELS in row and column scan intermediate patterns, said PIXEL coding logic circuit also coding "1," "0,""T" and "P" PIXEL types,

a composite pattern memory receiving the coded output of said PIXEL coding logic circuit,

a neighbor search logic circuit accessing said composite pattern memory and processing each PIXEL received therefrom by assigning thereto a numerical value that is a function of that PIXEL'S type and the type of its four near neighbor PIXELS, and

an accumulator receiving the output of said neighbor search logic circuit.

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**4,298,859**

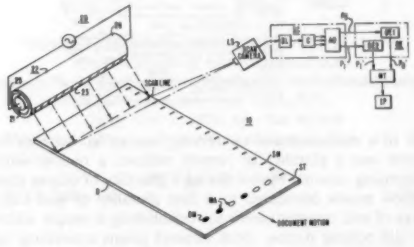
## DIGITAL VIDEO LINE DELAY CIRCUIT

**Michal M. Feilchenfeld, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed May 21, 1980, Ser. No. 151,861**

**Int. Cl.³ G06K *7/016***

**U.S. Cl. 340—146.3 Z** **7 Claims**



**1.** In an optical reading system having a line scan camera for scanning a document on a line-by-line basis and generating an analog signal for each video scan line indicative of information appearing on the document, said document having preprinted scan marks for document verification or registration and data entry mark areas for accepting information such as a student test answer sheet, a voting ballot, an order entry form, etc., an analog-to-digital converter means for converting the analog signal to a digital signal, and a totalizer circuit means for summing the digital signals corresponding to each of the mark areas and storing this information for processing,

the improvement for rendering the system compatible with both a preprinted document format that has a scan mark preceding the first data entry mark areas, and a preprinted document format that has data entry mark areas preceding the first scan mark, the improvement comprising:

a video scan line delay means connected between said analog-to-digital converter means and the totalizer circuit means, said delay means including a zero line delay for transmitting the digital output of the analog-to-digital converter means without any delay, and one or more line delay circuits, each producing a digital delay output signal

corresponding to a different predetermined number of line delays of the digital output signal of said analog-to-digital converter means, and

a delay select means for selecting one of said outputs of said video scan line delay means for transmission to said totalizer circuit means, the zero line delay circuit output being selected for a document format wherein a scan mark precedes the first data entry mark areas, in the event the document format consists of data entry mark areas preceding the first scan mark, said delay select means selecting the digital delay output of the line delay circuit which produces a sufficient number of line delays in the transmission of the digital signals from said analog-to-digital converter means to said totalizer circuit means to prevent the loss of information appearing in the data entry mark areas preceding the first scan mark or appearing during the line scan verification of a scan mark.

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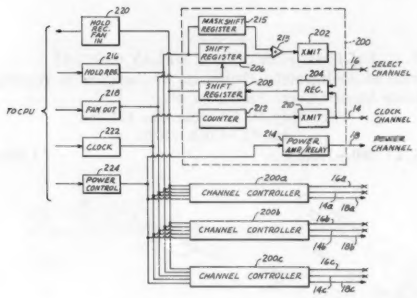
## 4,298,860
## MONITOR AND CONTROL APPARATUS

**Gayle R. Norberg, Columbia Heights, and Lee R. Hartung, Coon Rapids, both of Minn., assignors to Control Data Corporation, Minneapolis, Minn.**

**Filed Mar. 10, 1980, Ser. No. 129,054**
**Int. Cl.³ H04Q *9/00***
**U.S. Cl. 340—825.04** **29 Claims**




**1**. In a command and monitoring system having a central station and a plurality of remote stations, a remote station comprising: counter means having a plurality of output states; address means connected to a first plurality of said output states of said counter means for establishing a unique address for said remote station; clock channel means connecting said counter means to said central station for supplying clock signals to said counter means for sequencing said counter means through its output states; select channel means connected between said central station and said remote station, said central station supplying select signals onto said select channel means; monitor means for receiving a plurality of monitor condition signals, said monitor means being connected to a second plurality of said output states of said counter means other than said first plurality of said output states; transmitter means connected to said address means and to said monitor means for transmitting address and monitor data onto said select channel means; control means connected to said select channel means and to said second plurality of said output states of said counter means and responsive to a select signal when said counter means has conditioned one of its respective second output states for operating a corresponding command function at said remote station; disable means for selectively disabling said control means; and selective means connected to said address means and said select channel means and responsive to the unique address for the remote station and to select signals on said select channel means to operate said disable means whenever such select signals correspond to an address other than the address for the respective remote station.

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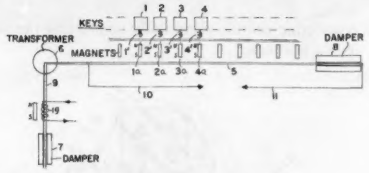
## 4,298,861
## INTEGRATED ULTRASONIC MAGNETIC ENCODER

**Jacob Tellerman, Bayside, N.Y., assignor to Temposonics, Incorporated, Plainview, N.Y.**

**Filed Jul. 10, 1978, Ser. No. 922,819**
**Int. Cl.³ G06F *3/02***
**U.S. Cl. 340—365 L** **12 Claims**




**1**. A keyboard encoding system comprising,

a plurality of movable magnetic keys,

a waveguide located in relation to the keys so that the magnetic field of the keys may be moved into operative magnetic engagement with the waveguide,

means to apply a pulse to said waveguide whereby when one of the keys is moved into magnetic engagement with said waveguide, a signal will be produced, said signal being delayed relative to the applied pulse so that the key can be identified.

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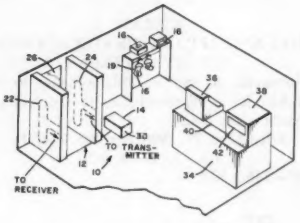
## 4,298,862
## AMORPHOUS ANTIPILFERAGE MARKER

**John A. Gregor, Basking Ridge, N.J., and Gregory J. Sellers, Richmond, Va., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.**

**Filed Apr. 23, 1979, Ser. No. 32,196**
**Int. Cl.³ G08B *13/26***
**U.S. Cl. 340—572** **7 Claims**




**1**. For use in a magnetic theft detection system, a marker adapted to generate magnetic fields at frequencies that are harmonically related to an incident magnetic field applied within an interrogation zone and have selected tones that provide said marker with signal identity, said marker being an elongated, ductile strip of amorphous ferromagnetic material and retaining its signal identity after being flexed or bent.

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## 4,298,863
## PORTABLE PATIENT CALL

**Donald P. Natitus, Aurora, and Curt T. Carlson, Denver, both of Colo., assignors to St. Anthony Hospital Systems, Denver, Colo.**

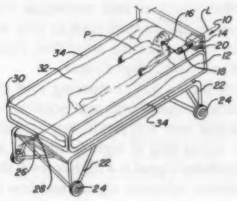
**Filed Feb. 10, 1980, Ser. No. 117,615**
**Int. Cl.³ G08B *21/00*; A61B *5/10***
**U.S. Cl. 340—573** **13 Claims**

**1**. A self-contained, electrically isolated patient call device which can be used by a patient having limited muscular movement, said device comprising:

a battery energy power source which is of low voltage to prevent electrical shock;

electrical switch means arranged in conjunction with a pneumatic actuation means which permits the making and breaking of electrical contacts in response to the movement of said pneumatic means;

means for positioningly adjusting the relationship of the switch means with respect to said pneumatic means whereby the sensitivity of the actuation of said switch means with the movement of the pneumatic means can be precisely adjusted;



alarm means connected to said electrical switch means and powered by said battery power source whereby when said contacts are made, an alarm signal is generated for alerting persons to the needs of said patient; and

an open pneumatic transducer means arranged in juxtaposition to a portion of the patient's body and connected by a tube means to said pneumatic actuation means whereby a minor muscular movement by said patient will cause the pneumatic actuation means to energize said contact means to produce said alarm signal.

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**4,298,864**

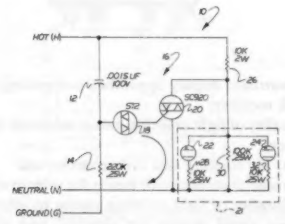
## POWER LINE FAULT DETECTOR CIRCUIT

**Earl A. Mahnke, Eastlake, and Christopher J. Zoller, Painesville, both of Ohio, assignors to The Ericson Manufacturing Company, Willoughby, Ohio**

**Filed Dec. 14, 1979, Ser. No. 103,460**

**Int. Cl.³ G08B *21/00;* H02H *3/16***

**U.S. Cl. 340—657** **12 Claims**




1. Apparatus for connection to the hot, neutral and ground conductors of a power line for detecting faulty power line connections and providing an indication thereof, comprising:

first and second impedances connected in series between said hot and ground conductors, said first impedance being capacitive and connected to said hot conductor, and the values of said impedances being selected so that the voltage at the junction thereof does not exceed a preselected limit with respect to said neutral conductor unless said power line is faulted,

trigger means connected betwen said neutral conductor and said junction for determining when the voltage therebetween has exceeded said preselected limit, said trigger means switching from a high impedance to a low impedance when said limit is exceeded, whereby a surge of current passes through said trigger means whenever said limit is exceeded, and,

means for detecting said surges of current for then indicating that said power line is faulted.

**4,298,865**

## DISPLAY DEVICE FOR ELECTRONIC CALCULATOR OR THE LIKE

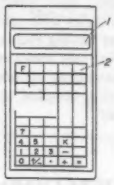
**Sigeaki Masuzawa, Nara; Mituhiro Saiji, Kyoto, and Akira Tanimoto, Kashihara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan**

**Filed Jul. 18, 1979, Ser. No. 58,666**

**Claims priority, application Japan, Jul. 26, 1978, 53-91686**

**Int. Cl.³ G06F *3/14***

**U.S. Cl. 340—706** **18 Claims**



1. An electronic calculator comprising:

calculating means for performing arithmetic operations and for producing an output representative of the results of these operations;

prompting means for generating signals representative of operating instructions for instructing the user of procedures used by said calculating means;

a multiple character display;

first means for converting the output of said calculating means into a display signal to statically display the results of said arithmetic operations of said multiple character display; and

second means for converting the signals generated by said prompting means into alphanumeric display signals to generate a running display of said operating instructions on said multiple character display.

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**4,298,866**

## LIQUID CRYSTAL DISPLAY DEVICE HAVING CAPACITANCE COMPENSATION

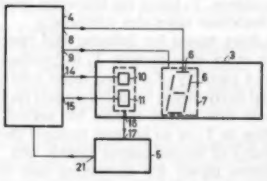
**Andreas M. L. Hodemaekers, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Nov. 5, 1979, Ser. No. 91,429**

**Claims priority, application Netherlands, Dec. 15, 1978, 7812214**

**Int. Cl.³ G06F *3/14***

**U.S. Cl. 340—713** **7 Claims**



1. A display device comprising

a display screen having a plurality of display elements and a measuring element, said display screen comprising a liquid crystal enclosed between a first and a second cover plate each having a plurality of excitation electrodes for applying electric display drive voltages to said display elements and for applying an electric measuring device voltage to said measuring element;

an excitation circuit for generating said display drive voltages and said measuring drive voltage;

a control circuit having at least a measuring input for an electric measuring signal, said measuring input being cou-

pled to one of said excitation electrodes of said measuring element, and at least a control output for an electric control signal,

said control circuit adjusting amplitudes of said display drive voltages and of said measuring drive voltage to a value corresponding to the threshold voltage of the liquid crystal in response to impedance variations of said measuring element resulting from temperature and voltage dependence of said liquid crystal,

characterized in that said display screen also comprises an auxiliary measuring element which differs in size from said measuring element, said auxiliary measuring element being arranged in series with said measuring element, said series arrangement having ends coupled to said excitation circuit for supplying said measuring drive voltage, and the junction of the measuring element and the auxiliary measuring element being coupled to said measuring input of said control circuit.

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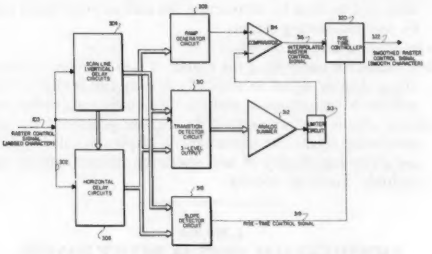
**4,298,867**

## CATHODE RAY TUBE CHARACTER SMOOTHER

**Philip V. C. Craig, Hunter, Utah, assignor to System Concepts, Inc., Salt Lake City, Utah**

**Filed Jul. 6, 1979, Ser. No. 55,688**
**Int. Cl.[3] G08B 5/36**
**U.S. Cl. 340—728** **13 Claims**



1. A character smoother apparatus for use in a display system or the like which incorporates horizontal timing signals to sweep and return a scanning beam or the like within a time $T_s$ horizontally across a display screen along one of a plurality of horizontal scan lines, vertical timing signals to position the beam vertically at the beginning of an appropriate horizontal scan line, and character generation circuitry to generate a raster control signal that inhibits the sweeping beam in time increments of $T_c$ and in a patterned sequence to form characters on the screen, $T_c$ being the character resolution time, said character smoother apparatus comprising

vertical delay means for delaying said raster control signal one or more time periods $T_s$ to produce as first output signals a plurality of delayed raster control signals;

horizontal delay means for delaying said raster control signal and said first output signals for periods of time corresponding to $T_c$ or an integral multiple thereof to produce a plurality of second output signals; and

interpolation means for combining said first and second output signals and said raster control signal to produce an interpolated raster control signal that is resolved in time increments which are less than $T_c$, said interpolation means including

transition detector means for generating a first transition indicator signal for each positive transition (beam not inhibited) of said raster control signal, said first output signals, and said second output signals, and a second transition indicator signal for each negative transition (beam inhibited) of said raster control signal, said first output signals, and said second output signals;

summing means for combining said first transition indicator signals with said second transition indicator signals to produce a composite transition indicator signal representing the net sum of all transitions, positive transitions adding and negative transitions subtracting, occurring in said raster control signal and said first and second output signals at a given $T_c$ increment;

ramp generating means for generating a positive going ramp signal that starts at a minimum voltage level and increases in a certain time to a maximum voltage level for each positive transition (beam not inhibited) of one of said second output signals, and a negative going ramp signal that starts at said maximum voltage level and decreases in said certain time to said minimum voltage level for each negative transition (beam inhibited) of said second output signal; and

comparator means for comparing said composite transition indicator signal with said positive or negative going ramp signal and for producing an interpolated raster control signal that is high (beam not inhibited) whenever said ramp signal is a higher level than said composite transition indicator signal, and low (beam inhibited) whenever said ramp signal is a lower level than said composite transition indicator signal, said interpolated raster control signal thus being resolved in time increments which are less than $T_c$.

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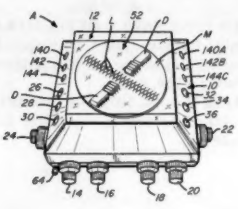
**4,298,868**

## ELECTRONIC DISPLAY APPARATUS

**John R. Spurgeon, 4407 Pack Saddle Pass, Austin, Tex. 78745**

**Filed Apr. 11, 1980, Ser. No. 139,178**
**Int. Cl.[3] G08B 5/36**
**U.S. Cl. 340—755** **9 Claims**



1. An electronic display apparatus, comprising:

(a) a disk member;

(b) a plurality of light emitting means mounted with said disk member;

(c) means for rotating said disk member; and

(d) electronic control circuit means for selectively activating said plurality of light emitting means to selectively form differing visual images for viewing, said circuit means comprising:

(1) input means for forming an electronic control signal defining the pattern, position, size and shape of the visual images to be formed as specified by a user; and

(2) decoder means for decoding the electronic control signals to selectively activate said plurality of light emitting means to form the specified visual images.

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**4,298,869**

## LIGHT-EMITTING DIODE DISPLAY

**Yasuo Okuno, Sendai, Japan, assignor to Zaidan Hojin Handotai Kenkyu Shinkokai, Sendai, Japan**

**Filed Jun. 25, 1979, Ser. No. 52,014**
**Claims priority, application Japan, Jun. 29, 1978, 53-79618**
**Int. Cl.[3] G08B 5/36**
**U.S. Cl. 340—782** **40 Claims**

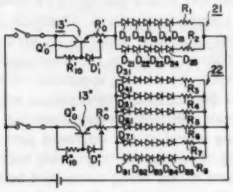
1. A light-emitting diode (LED) lamp comprising:

a housing including a lamp base of a predetermined shape adapted for effecting electrical connection to a commer-

cial AC power source, said AC power source having a predetermined maximum voltage;

a current-regulating means electrically connected to said lamp base and disposed in said base to facilitate dissipation of heat generated by said current-regulating means through said base; and

a display panel connected mechanically to said housing and



electrically to said current regulating means and including a multiplicity of light-emitting diodes, groups of said diodes being connected in series, said series connected group having an operating threshold voltage at least about one half of said predetermined maximum voltage said groups being electrically connected in parallel said multiplicity of light emitting diodes being driven simultaneously by the current from said regulating means.

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**4,298,870**

## DEVICE FOR DRIVING A DISPLAY ELEMENT HAVING A MEMORIZING PROPERTY

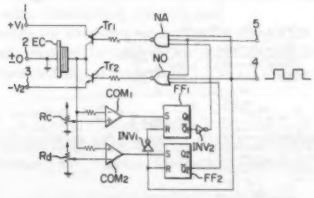
**Takashi Saegusa, Sagamihara, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan**

**Filed Oct. 9, 1979, Ser. No. 82,884**

**Claims priority, application Japan, Oct. 9, 1978, 53-123565**

**Int. Cl.³ G02F 1/17**

**U.S. Cl. 340—785** **8 Claims**



1. A device for controlling an electro-optical display element of the type which is capable of storing charge, the display element being in a colored state upon the application thereto of a first polarity voltage for storing a first quantity of charge and being in a colorless state upon the application thereto of an opposite polarity voltage for storing a second quantity of charge, the display element remaining in said states for predetermined periods of time after removal of said voltages, comprising means for detecting the quantity of charge stored in the display element, the detecting means including a first detecting circuit for producing a first signal when the quantity of charge stored differs from a first predetermined range of values required for the display element to be in the colored state, and a second detecting circuit for producing a second signal when the quantity of charge stored differs from a second predetermined range of values required for the display element to be in the colorless state, and drive means for applying said voltages to the display element, the drive means including a first driving circuit for applying the first polarity voltage to the display element in response to the first signal and to the occurrence of a display command signal, and a second driving circuit for applying said other polarity voltage to the display element in response to the second signal and to the non-occurrence of the display command signal.

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**4,298,871**

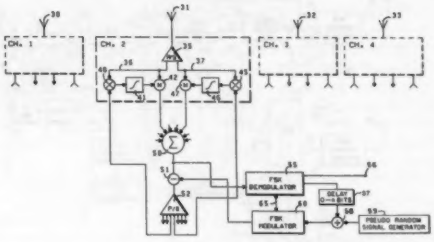
## DESIRED SIGNAL ESTIMATOR FOR NULL STEERER FM RECEPTION USING FSK MODULATION

**Peter D. Kennedy, Mesa, and Gregory H. Piesinger, Scottsdale, both of Ariz., assignors to Motorola Inc., Schaumburg, Ill.**

**Continuation-in-part of Ser. No. 910,935, May 30, 1978, abandoned. This application Jun. 11, 1979, Ser. No. 47,610**

**Int. Cl.³ H01Q 3/26**

**U.S. Cl. 343—100 SA** **7 Claims**



1. In a multiple antenna array, null steering apparatus for reception of a desired signal wherein an identifier signal is transmitted with the desired signal, the desired signal including bits of data delayed a predetermined period relative to the identifier signal and the identifier signal including the bits of data summed with a pseudo random signal and substantially reduced in amplitude relative to the desired signal, said desired signal and said identifier signal being summed and utilized to FSK modulate a carrier prior to transmission, said null steering apparatus comprising:

(a) feedback means associated with each antenna in said array for adjusting the amplitude and phase of signals therein so that unwanted signals from the array are cancelled;

(b) demodulation means, including normal delay, coupled to said feedback means for removing the carrier and separating the desired signal from the identifier signal;

(c) pseudo random signal generating means for providing an output signal substantially similar to the pseudo random signal in the transmission;

(d) combining means coupled to the demodulation means for receiving the identifier signal and coupled to the generating means for subtracting the pseudo random signal from the identifier signal;

(e) delay means incorporated into said apparatus, in addition to said normal delay in said demodulation means, for delaying the separated identifier signal sufficient to bring the identifier signal substantially into phase with the desired signal; and

(f) modulation means coupled to said combining means and said feed back means for receiving the delayed bits of data remaining in said identifier signal and FSK modulating a carrier therewith to supply a reference signal substantially in phase with the desired signal to said feedback means to form a lobe in the antenna pattern in the direction of the desired signal.

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**4,298,872**

## SIDELOBE BLANKING SYSTEM

**William E. Rodgers, Simi Valley, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.**

**Filed May 27, 1980, Ser. No. 153,284**

**Int. Cl.³ H04B 7/00**

**U.S. Cl. 343—100 LE** **1 Claim**

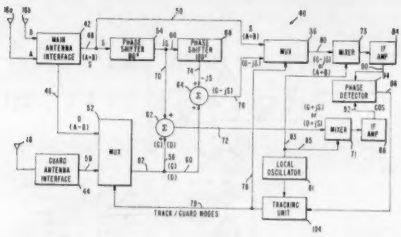
1. In a radar system including main antenna means for re-

ceiving electro-magnetic energy from a target and circuit means coupled to said main antenna means for generating tracking signals corresponding to the position of said target relative to said main antenna means, an improved sidelobe blanking system comprising:

guard antenna means for receiving electro-magnetic energy reflected from a target in a sidelobe region of said main antenna means;

first phase shifting means operably coupled to the said main antenna means and for shifting the output thereof by 90°;

first summing means for summing the outputs of said guard antenna means and said first phase shifting means;




second phase shifting means coupled to the output of said first phase shifting means for shifting the output thereof by 180°;

second summing means for summing the outputs of said guard antenna means and said second phase shifting means;

phase detector means for generating an output signal corresponding to the phase angle between the outputs of said first and second summing means; and

means for generating a signal which represents the cosine of the output of said phase detecting means.

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**4,298,873**

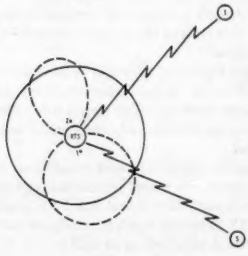
**ADAPTIVE STEERABLE NULL ANTENNA PROCESSOR**

**Eugene L. Roberts, Maitland, Fla., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Jan. 2, 1981, Ser. No. 222,104**

**Int. Cl.[3] H04B *7/00***

**U.S. Cl. 343—100 SA** **11 Claims**



1. A steerable null antenna processor system for receiving desired wave energy signals from at least one angular region of space within the area covered by the system and for suppressing interfering signals from at least one other angular region, using antenna means having at least first and second antenna elements; said processor system comprising:

nulling means coupled between said antenna elements and a common port for supplying said desired wave energy signals to said common port;

said nulling means comprising phase means and amplitude means, both the phase means and the amplitude means being adjustable in incremental steps and having control inputs, operative in response to control signals at the control inputs to adjust respectively the phase and amplitude values of the nulling means; the amplitude means being a variable ratio combiner comprised of a quadrature hybrid, a sum-difference hybrid, and two adjustable delay lines between said hybrids;

digital controller means having clock means, sample storage means, comparison means, feedback input means, and phase and amplitude memory means having connections to said control inputs of the phase and amplitude means respectively; there being apparatus between said common port and the feedback input means which supplies feedback signals containing a representation of the level of the interfering signal at the common port; the clock means supplying clock signals to provide successive cycles, the comparison means being connected and operative during each cycle to compare a feedback signal from the feedback input means to a previous sample thereof stored in said sample storage means to indicate improvement or no improvement, and to supply said control signals via said memory means to said nulling means to make an appropriate adjustment for steering at least one null to the interfering signals.

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**4,298,874**

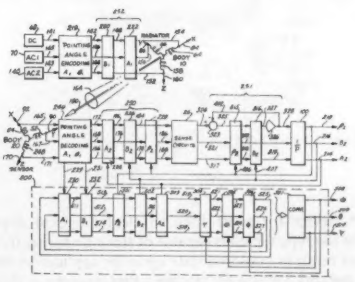
**METHOD AND APPARATUS FOR TRACKING OBJECTS**

**Jack Kuipers, Grand Rapids, Mich., assignor to The Austin Company, Cleveland, Ohio**

**Continuation-in-part of Ser. No. 759,723, Jan. 17, 1977, abandoned, which is a continuation-in-part of Ser. No. 733,353, Oct. 18, 1976, abandoned, and a continuation-in-part of Ser. No. 952,263, Oct. 18, 1978, abandoned, which is a continuation of Ser. No. 759,723,. This application Oct. 24, 1978, Ser. No. 954,126**

**Int. Cl.[3] G01S *3/02***

**U.S. Cl. 343—112 R** **70 Claims**



1. Apparatus for determining a pointing angle to a first body from a second body comprising:

at least two independently oriented first body radiating means coupled to said first body and defining a first reference coordinate frame;

a first means for applying to said first body radiating means first actuating signals for producing a first field radiated in response to said first signals oscillating along a first line of generation and characterizing a first body pointing angle of a first pointing vector with respect to said first reference frame, said first field having receivable components characterized in that at said second body one direction in said first field has unique characteristics with respect to all other directions in said first field;

at least two independently oriented second body receiving means coupled to said second body and defining a second

reference coordinate frame for detecting and measuring the receivable components of said first field; and

a second body analyzing means coupled to said second body receiving means for converting said first field components into a second body pointing angle, from said second body to said first body, relative to said second reference coordinate frame.

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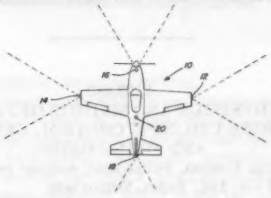
**4,298,875**

## AIRCRAFT COLLISION AVOIDANCE SYSTEM

**Roger M. Sullivan, Colorado Springs, Colo., assignor to Leo K. O'Brien and Thomas B. Carney, both of Colorado Springs, Colo.**

**Filed Feb. 2, 1979, Ser. No. 9,829**
**Int. Cl.³ G01S 3/02, 1/10**
**U.S. Cl. 343—112 CA** **15 Claims**



**9.** An aircraft collision avoidance system for providing an indication of the relative position of any two interferring aircraft, when such aircraft come within a predetermined range of one another, wherein each aircraft includes in combination:

a plurality of directional, transmit/receive antennae mounted on the aircraft, each antenna defining a separate zone about the aircraft;

transmitter means for transmitting through each of said antennae a coded signal which is unique to that antenna;

receiver means attached to each of said antennae for receiving through the antennae, transmitted coded signals from said other interferring aircraft; and

logic means for decoding said received signals for providing an indication of the zone on the other aircraft from which the received signal originated.

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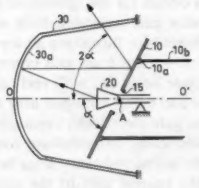
**4,298,876**

## POLARIZER FOR MICROWAVE ANTENNA

**Pierre Crochet, Paris, France, assignor to Thomson-CSF, Paris, France**

**Filed Feb. 25, 1980, Ser. No. 123,950**
**Claims priority, application France, Mar. 2, 1979, 79 05499**
**Int. Cl.³ H01Q 19/195**
**U.S. Cl. 343—756** **10 Claims**




**1.** A polarizer for a microwave antenna operating at a wavelength λ, comprising:

a polarization filter;

a reflector; and

means for rigidly joining said polarization filter and said reflector so that they are spaced at a distance $\lambda/4$ from one another, the polarization filter including a conductive plate, and a periodic network of resonant slots at the operating frequency of the antenna provided in said conductive plate.

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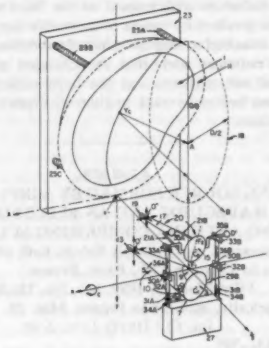
**4,298,877**

## OFFSET-FED MULTI-BEAM TRACKING ANTENNA SYSTEM UTILIZING ESPECIALLY SHAPED REFLECTOR SURFACES

**Carlyle J. Sletten, Acton, Mass., assignor to Solar Energy Technology, Inc., Bedford, Mass.**

**Filed Jan. 26, 1979, Ser. No. 7,155**
**Int. Cl.³ H01Q 19/14**
**U.S. Cl. 343—781 CA** **21 Claims**



**1.** An antenna system for radiating and receiving electromagnetic energy at frequencies above 30 mHz comprising:

two shaped subreflectors being generally separated, non-conic section surfaces and each separately being illuminated and fed by one or more horn radiators and one of the said shaped subreflectors with its illuminating horn radiator or horn radiators being called herein the principal feed and other shaped subreflector with illuminating horn radiator or horn radiators being called herein the secondary feed; and

a shaped main reflector being also generally a non-conic section surface mounted in a position fixed with respect to a fixed frame of coordinates referred to the earth's surface and said shaped main reflector being illuminated independently by said principal feed and said secondary feed such that said antenna system produces one or more antenna radiation pattern or patterns each with a main antenna beam pointed in a direction corresponding to the locations and orientations of the main shaped reflector, one of the shaped subreflectors, and one of the horn radiators; and

the orientation of said shaped main reflectors with respect to that of the principal feed and the secondary feed being an offset position such that electromagnetic energy radiated to and from the said principal feed and said secondary feed to illuminate said shaped main reflector is largely unobstructed and the electromagnetic energy passing to and from the shaped main reflector surface from signal sources located in directions of said antenna main beams is also largely unobstructed, said orientation of the main shaped subreflector with respect to the principal feed and the secondary feed being referred to a plane of left-right symmetry which divides the shaped main reflector surface and the two shaped subreflector surfaces into nearly equal left-right symmetric portions and such that the center of the shaped subreflector surfaces, the directions of the axes of the several horn radiators and the direction of the antenna main beams all lie approximately in said plane of left-right symmetry, and the orientation of the two shaped subreflectors is such as to position one shaped subreflector above the other and such that the focal region of the main

reflector lies between the said two shaped subreflectors and the shaped main reflector; and

the shapes of said shaped subreflectors and said shaped main reflector being constructed to produce a prescribed electromagnetic power and phase distribution over the aperture of the shaped main reflector which distribution includes a nearly uniform power and phase aperture distribution when said shaped subreflectors and main reflector are illuminated by said horn radiators and antenna portions are oriented and positioned as specified above to produce said antenna patterns and antenna beams; and

said antenna beams being scanned in angular directions by changing the positions of said two subreflectors and their horn radiators with respect to the fixed shaped main reflector position by means of moveable supports and apparatus attached to said two shaped subreflectors and to said horn radiators such that the changed positions of the shaped subreflectors and the horn radiators enable the antenna beams to track angular changes in signal source directions.

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**4,298,878**

## RADIATING SOURCE FORMED BY A DIPOLE EXCITED BY A WAVEGUIDE AND AN ELECTRONICALLY SCANNING ANTENNA COMPRISING SUCH SOURCES

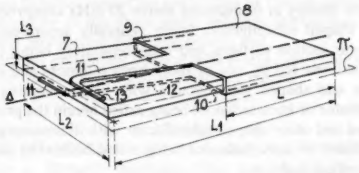
**Albert Dupressoir, and Francois Salvat, both of Paris, France, assignors to Thomson-CSF, Paris, France**

**Filed Mar. 25, 1980, Ser. No. 133,883**

**Claims priority, application France, Mar. 28, 1979, 79 07801**

**Int. Cl.³ H01Q** *1/38, 1/36*

**U.S. Cl. 343—795** **17 Claims**




1. A radiating source formed by a dipole with two stems excited by a rectangular-section waveguide, comprising a dielectric sheet in the form of a rectangular prism of length $L_1$, width $L_2$ and height $L_3$ whose two opposite major faces parallel to a longitudinal midplane $\pi$ and two opposite minor faces perpendicular to said midplane and parallel to the longitudinal centerline $\Delta$ of the sheet are each covered with a metal layer of length L less than $L_1$ for forming said waveguide, the metal layers covering said major opposite faces being each extended along said centerline $\Delta$ by a metal tongue of reduced width terminating in a respective stem of said dipole.

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**4,298,879**

## FIELD EFFECT TRANSISTOR

**Yutaka Hirano, Atsugi, Japan, assignor to Fujitsu Limited, Kawasaki, Japan**

**Filed Feb. 4, 1980, Ser. No. 118,225**

**Claims priority, application Japan, Feb. 9, 1979, 54-14099**

**Int. Cl.³ H01L** *29/80*

**U.S. Cl. 357—22** **5 Claims**

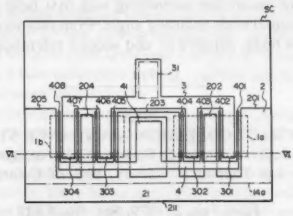
1. A transistor device having interdigital electrodes on a surface of a semiconductor body, said device comprising

an insulating substrate,

a plurality of active semiconductor regions placed on said insulating substrate,

source and drain electrodes placed on said plurality of active semiconductor regions, said source and drain electrodes being interconnected at the opposite ends with contact pad areas, respectively, and

gate electrodes placed between said source and drain electrodes and connected together with a gate contact pad




area, said gate contact pad area being placed between a pair of adjacent ones of said active semiconductor regions.

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**4,298,880**

## POWER THYRISTOR AND METHOD OF FABRICATION THEREFORE UTILIZING CONTROL, GENERATING, AND FIRING GATES

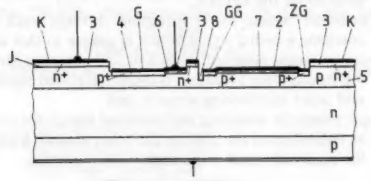
**Roland Sittig, Umiken, Switzerland, assignor to BBC, Brown, Boveri & Co., Ltd., Baden, Switzerland**

**Filed Feb. 6, 1979, Ser. No. 9,913**

**Claims priority, application Switzerland, Jun. 15, 1978, 6523/78**

**Int. Cl.³ H01L** *29/74*

**U.S. Cl. 357—38** **3 Claims**




1. A power thyristor formed by four zones of alternating conductivity type with cathode and anode zones respectively adjacent opposed thyristor main cathode and anode surfaces, and a cathode-base zone and an anode-base zone respectively adjacent said cathode and anode zones, comprising:

said thyristor having portions of said cathode-base zone extended to said cathode main surface on which there is formed at least one control gate adapted to be coupled to an ignition circuit for the ignition of the thyristor, at least one generator gate separated from said control gate but adjacent thereto for furnishing a current to ignite parts of the thyristor remote from said control gate, and at least one firing gate being fed with said current from said generator gate and being arranged near said remote parts;

said generator gate electrically connected to said firing gate with no intervening cathode-base zone;

the ratio of the lateral resistance $R'_{GK}$ between the generator gate and the nearest part of the cathode zone, and the lateral resistance $R_{GK}$ between the firing gate ZG and the nearest part of the cathode zone, satisfying the relationship $R_{GK}/R'_{GK} < \frac{1}{3}$; and

the ratio between the edge—length of the generator gate and the edge—length of the firing gate satisfying the relationship $I'_G \cdot R_{GK} < 0.2$ V, where $I'_G$ denotes the minimum gate current at which the thyristor still fires in the vicinity of the firing gate.

**4,298,881**

## SEMICONDUCTOR DEVICE WITH DOUBLE MOAT AND DOUBLE CHANNEL STOPPERS

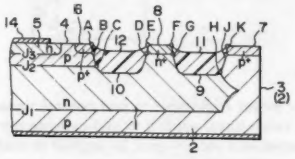
**Shuroku Sakurada; Yoichi Nakashima; Isao Kojima; Hideyuki Yagi; Tadaaki Kariya, and Masayoshi Sugiyama, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Apr. 7, 1980, Ser. No. 138,085**

**Claims priority, application Japan, Apr. 6, 1979, 54-40935**

**Int. Cl.³ H01L *29/47***

**U.S. Cl. 357—38** **7 Claims**




1. A semiconductor device comprising

(a) a semiconductor substrate having first and second main surfaces, at least three semiconductor layers whose conductivity types alternate between said main surfaces and a portion of each of which is exposed, respectively, in said first main surface, two moats provided concentrically in said first main surface in which moats the edges of the pn-junctions formed by said layers are exposed, and channel stopper semiconductor regions which are formed on the surfaces of said layers exposed in said first main surface, each region being highly-doped with respect to its respective underlying layer, and being contiguous to said moats and apart from said pn-junctions, each of said regions having the same conductivity type as the layer on which said region is formed;

(b) surface passivating material filling said moats; and

(c) a pair of main electrodes provided on said first and second main surfaces of said substrate.

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**4,298,882**

## MULTILAYER SEMICONDUCTOR ELEMENT

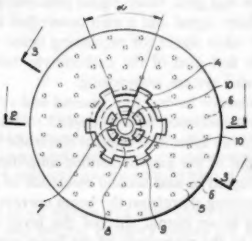
**Jaroslav Homola, Kladno; Karel Remajzl, and Milan Prokes, both of Prague, all of Czechoslovakia, assignors to CKD Praha, obrovy podnik, Prague, Czechoslovakia**

**Continuation-in-part of Ser. No. 935,907, Aug. 23, 1978, abandoned. This application Oct. 15, 1980, Ser. No. 197,258**

**Claims priority, application Czechoslovakia, Aug. 23, 1977, 5529-77**

**Int. Cl.³ H01L *29/74***

**U.S. Cl. 357—38** **2 Claims**




1. A multilayer semiconductor element comprising a layer of a fundamental semiconductor material, a first and a second external semiconductor layer with a type of electrical conductivity opposite from that of the layer of the fundamental semiconductor material, the layer of fundamental semiconductor material being situated between said two external semiconductor layers, an emitter layer and an auxiliary emitter layer of the same type of conductivity as the layer of the fundamental semiconductor material being provided on the second external semiconductor layer, a first main electrode on the first external semiconductor layer, a second main electrode disposed above and in contact with the emitter layer on the second external semiconductor layer and also in contact with the second external semiconductor layer in a number of places and forming so-called microleaks, an auxiliary contact in contact with a part of the auxiliary emitter layer on the second external semiconductor layer and also in contact with the second external semiconductor layer, a central control electrode on the second external semiconductor layer, said auxiliary contact being provided between the second main electrode and the control electrode, the auxiliary emitter layer being situated between the control electrode and the peripheral edge portion of the emitter layer, the emitter layer being in contact with the second main electrode with the exception of the peripheral edge portion of the second main electrode near the control electrode, whereby the auxiliary emitter layer is in contact with the auxiliary contact, the auxiliary emitter layer being divided into at least two parts mutually separated by zones of the second external semiconductor layer, the peripheral edge portion of the emitter layer in the direction toward the control electrode being equally separated by zones of the second external semiconductor layer, said zones reaching up to contact the second main electrode and being equal in number to the parts of the auxiliary emitter layer, the geometric arrangements between the second external semiconductor layer and the second main electrode being the same in all parts of the surface of the emitter layer, the microleaks lying on circles with centers at the center of each part of the thus divided border of the emitter layer, said circles, having a radius equal to at least 1.5 times the distance of the centers of each nearest two microleaks from each other.

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**4,298,883**

## PLASTIC MATERIAL PACKAGE SEMICONDUCTOR DEVICE HAVING A MECHANICALLY STABLE MOUNTING UNIT FOR A SEMICONDUCTOR PELLET

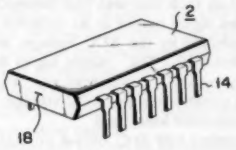
**Shigeru Komatsu, Yokohama; Satoshi Takahashi, Tokyo, and Masao Wakatsuki, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan**

**Filed Apr. 25, 1978, Ser. No. 899,820**

**Claims priority, application Japan, Apr. 26, 1977, 52-47387**

**Int. Cl.³ H01L *23/28, 23/48, 29/44***

**U.S. Cl. 357—72** **14 Claims**




1. A packaged semiconductor device comprising:

a semiconductor pellet;

a mounting unit including:

(i) a planar mounting part having said semiconductor pellet adhesively mounted thereon;

(ii) a pair of supporting bars extending from said mounting part in opposite directions;

(iii) first side plate sections for reinforcing said planar mounting part, said first side plate sections formed by bending first edge portions of said mounting part at a first oblique angle with respect to the plane of said mounting part;

(iv) second side plate sections for reinforcing said planar mounting part, said second side plate sections formed by bending second edge portions of said mounting part

at a second oblique angle with respect to the plane of said mounting part;

a package member comprising an electrically insulative resin which contracts when cured to completely encapsulate said mounting unit and said semiconductor pellet in said resin substantially at the center of said package member, said resin being in direct contact with said pellet and said mounting unit, said side plate sections preventing stresses from damaging said pellet when said resin contracts; and

a plurality of individually separate lead members, each of said lead members being fixed to the package member and electrically connected at one end to said semiconductor pellet and extending at its other end outside of the package member.

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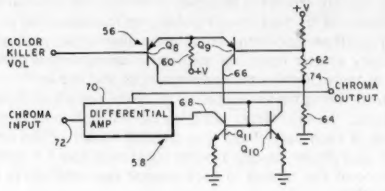
**4,298,884**

## CHROMA AMPLIFIER AND COLOR KILLER

**Daniel L. Reneau, Elmhurst, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.**

**Filed Mar. 31, 1980, Ser. No. 135,947**
**Int. Cl.³ H04N 9/49**
**U.S. Cl. 358—26** **10 Claims**




**1**. In a color television receiver, a chroma amplifier and color killer, comprising:

first and second emitter-coupled transistors receiving a current source having a D.C. operating component and an A.C. chroma signal component;

third and fourth emitter-coupled transistors receiving a current source having only a D.C. operating component substantially equal to the D.C. operating component received by the first and second transistors;

means for coupling a variable ACC voltage and a substantially fixed D.C. bias voltage to selected base terminals of said transistors such that said first transistor develops an A.C. chroma signal output at its collector whose amplitude is controlled by the ACC voltage, and said fourth transistor develops a D.C. output signal which includes substantially no A.C. component and whose amplitude varies with variations in the ACC voltage;

a D.C. actuated color killer; and

means for coupling said D.C. output voltage to said color killer.

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**4,298,885**

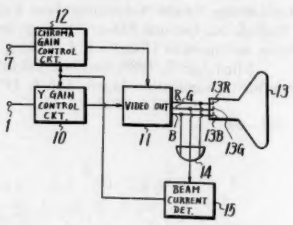
## LUMINANCE CONTROL CIRCUIT FOR A TELEVISION RECEIVER

**Takashi Okada, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan**

**Filed Oct. 15, 1979, Ser. No. 84,751**
**Claims priority, application Japan, Oct. 17, 1978, 53-127566**
**Int. Cl.³ H04N 5/14**
**U.S. Cl. 358—39** **29 Claims**

**1**. A luminance control circuit for a television receiver which is operative to reproduce a video signal applied to a cathode ray tube having a dynamic range between a cutoff level and a saturation level, comprising:

means for sensing a level of said video signal in respect to at least one of said cutoff level and said saturation level of the tube and for producing a control signal in response thereto; and




control means responsive to said control signal for varying said video signal applied to said cathode ray tube so as to maintain said video signal, as applied to said cathode ray tube, within said dynamic range.

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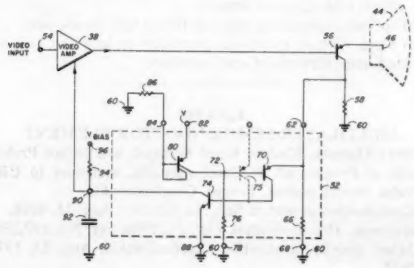
**4,298,886**

## AUTOMATIC PEAK BEAM CURRENT LEVELER SYSTEM

**Geoffrey W. Perkins, Geneva, Switzerland, assignor to Motorola Inc., Schaumburg, Ill.**

**Filed Dec. 12, 1979, Ser. No. 102,685**
**Int. Cl.³ H04N 5/68**
**U.S. Cl. 358—74** **10 Claims**




**8**. In a television including a cathode ray tube having at least one cathode and grid, video signal processing circuit for producing a video signal and a gain controlled amplifier responsive to the video signal for producing beam current between the cathode and grid of the cathode ray tube, a peak beam current leveler system, comprising:

a first transistor having first, second and control electrodes, said first electrode being coupled to the cathode of the cathode ray tube, said control electrode being coupled to an output of the gain controlled amplifier;

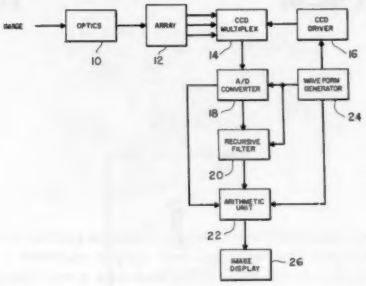
means coupled to said second electrode of said first transistor receiving therefrom the beam current for producing a voltage at an output thereof the level of which corresponds to the magnitude of the beam current; and

comparator means connected to said output of said voltage producing means for producing a gain control signal when said level of said voltage produced by said voltage producing means exceeds a predetermined threshold level, said gain control signal being applied to the gain controlled amplifier such that the peak beam current is automatically adjusted.

## 4,298,887
## NON-UNIFORMITY CORRECTION IN A MULTIELEMENT DETECTOR ARRAY

**Jonathan P. Rode, Thousand Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.**

**Filed Jun. 9, 1980, Ser. No. 157,588**
**Int. Cl.³ H04N 7/18**
**U.S. Cl. 358—113** **11 Claims**

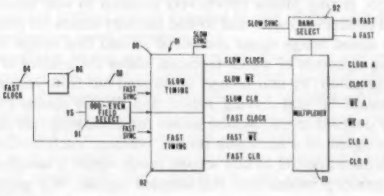



1. A method of correcting for non-uniformities in an element of a detector array, comprising the steps of:
(a) recording the output from the detector element at a plurality of times;
(b) weighting the recorded outputs;
(c) summing the weighted outputs for the detector element; and
(d) subtracting the summed output for the element from the present output of that element to provide a corrected output.

## 4,298,888
## NON-INTERLACED TO INTERLACED FORMAT VIDEO CONVERTER

**Joseph H. Colles, Oceanside, and James E. Cooper, Jr., Solona Beach, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.**

**Filed Jun. 8, 1979, Ser. No. 46,745**
**Int. Cl.³ H04N 5/02**
**U.S. Cl. 358—140** **11 Claims**

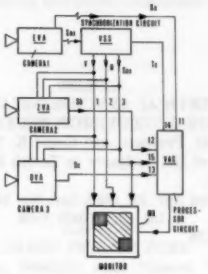



1. A video converter responsive to first and second frames of non-interlaced odd and even lines of input data received during first and second non-interlaced frame periods comprising:
first and second memory means each storing a line of input data,
a source of fast clock signals and slow clock signals coupled to said first and second memory means for being alternately applied to respective first and second memory means and to respective second and first memory means, alternating after each sequential pair of line periods of said input data, and
control means coupled to said first and second memory means for controlling said memory means to alternately write one line of input data in one memory means at the rate of said fast clock signals while reading one line of input data from the other memory means at the rate of said slow clock signals during first and second interlaced output field periods respectively occuring during said first and second non-interlaced frame periods, said control means including means to control said first and second memory means to write and read said odd lines of said input data during said first non-interlaced frame periods and to write and read said even lines of input data during said second non-interlaced frame periods.

## 4,298,889
## SYNCHRONIZATION CIRCUIT FOR VIDEO CLOCK OSCILLATORS

**Rudolf Burianek, and Gottfried Tschannen, both of Zürich, Switzerland, assignors to Siemenas-Albis AG, Zürich, Switzerland**

**Filed Mar. 5, 1980, Ser. No. 127,454**
**Claims priority, application Switzerland, Mar. 16, 1979, 2498/79**
**Int. Cl.³ H04N 5/04**
**U.S. Cl. 358—148** **10 Claims**




1. A synchronization circuit for video clock generators, in order to obtain a line synchronization simultaneous with a complete image synchronization, comprising:
a follow-up control having an output and delivering a clock frequency signal;
said follow-up control having a reference input and a comparison input;
a line pulse separation circuit having an output delivering an external horizontal pulse signal;
said follow-up control having said reference input connected with said output of the line pulse-separation circuit which delivers said external horizontal pulse signal;
an external complete image-characteristic pulse-separation circuit having an input and an output;
the reference input of the follow-up control being connected with the input of the external complete image-characteristic pulse-separation circuit;
both of the separation circuits being impinged at their input sides with a mixed pulse signal;
a comparator having a first input and a second input and delivering an output signal;
the external complete image-characteristic pulse-separation circuit being connected at its output with the first input of the comparator;
an internal complete image-characteristic pulse-separation circuit having a first input and a second input and delivering an output signal;
the second input of the comparator receiving the output signal of the internal complete image-characteristic pulse-separation circuit;
a regulation pulse-switch means having a first input and a second input;
the output signal of the comparator being infed to the first input of the regulation pulse-switch means;
said regulation pulse-switch means having an output;

a video clock generator having a clock input;

the output of the regulation pulse-switch means being connected with the clock input of said video clock generator;

said video clock generator having respective outputs delivering respectively an internal mixed pulse signal and an internal horizontal pulse signal;

said internal horizontal pulse signal being infed to the comparison input of the follow-up control and the first input of the internal complete image-characteristic pulse-separation circuit;

said internal complete image-characteristic pulse-separation circuit receiving at its second input the internal mixed pulse signal; and

said follow-up control having its output connected with the second input of the regulation pulse-switch means.

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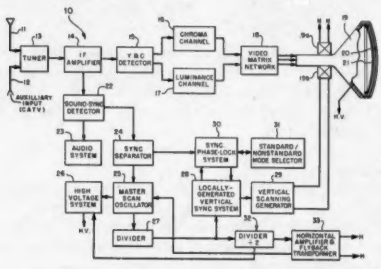
**4,298,890**

## DIGITAL VERTICAL SYNCHRONIZATION SYSTEM FOR A TELEVISION RECEIVER

**Stephen Lai, Mt. Prospect, and Gopal K. Srivastava, Buffalo Grove, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.**

**Filed Apr. 21, 1980, Ser. No. 142,291**
**Int. Cl.[3] H04N 5/04**
**U.S. Cl. 358—158** **18 Claims**




1. In a digital vertical synchronization system having a source of locally generated vertical sync pulses coupled to a vertical sweep system, a source of derived vertical sync pulses developed from and in a time relationship with received television signals, a phasing circuit for testing the time relationship between the derived vertical sync pulses and the locally generated vertical sync pulses, said phasing circuit outputting a signal indicative of the test, means responsive to the phasing circuit for adjusting the phase of the locally generated vertical sync pulses, and a mode recognition circuit for determining whether the received television signal includes equalizing pulses in a vertical interval, said mode recognition circuit having an output for indicating whether the digital synchronization system should operate in a standard mode wherein the phase of the locally generated vertical sync pulses is adjusted at a first rate or in a nonstandard mode wherein the phase of the locally generated vertical sync pulses is adjusted at a second rate lower than the first rate, the improvement comprising:

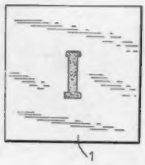
forced mode means, associated with said mode recognition circuit and responsive to the phasing circuit output signal, for automatically forcing said mode recognition circuit output to indicate nonstandard mode.

**4,298,891**

## TELEVISION RECEIVER

**Takaaki Baba, Nishinomiya; Takayuki Sagishima, Suita; Teruo Kitani, Takatsuki, and Reiichi Sasaki, Yawata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan**

**Filed Jun. 18, 1979, Ser. No. 49,637**
**Claims priority, application Japan, Jun. 19, 1978, 53-74462**
**Int. Cl.[3] H04N 5/22**
**U.S. Cl. 358—183** **3 Claims**




1. A television receiver comprising: television signal receiving means for simultaneously receiving two television signals to produce a first image signal and a second image signal corresponding to said television signals, respectively, each of which contains vertical synchronous signals and horizontal synchronous signals; synchronous signal producing means operatively coupled to said television signal receiving means for producing the vertical synchronous signals and the horizontal synchronous signals from said first and second image signals; memory means operatively coupled to said television signal receiving means for sampling and storing said second image signal; driving pulse producing means operatively coupled to said synchronous signal producing means and to said memory means for producing driving pulses to drive said memory means in accordance with said vertical synchronous signals and said horizontal synchronous signals applied thereto; mixing means operatively coupled to said television signal producing means and to said memory means for producing a mixed image signal composed of said first image signal having a portion of which replaced, under the control of said driving pulses, by said second signal read out from said memory means by said driving pulses; and display means operatively coupled to said mixing means for displaying said mixed image signal on a television screen, wherein: each horizontal synchronous period of said second image signal is sampled by said memory means into $N_H$ sampled signals, $N_H$ geing an integer; M horizontal synchronous periods of said second image signal are sequentially grouped into M/n sequential groups, each group consisting of n horizontal synchronous periods, M and n being integers, and $M>n$; and n sampled signals which are sampled by said memory means from each of said group of n adjacent horizontal synchronous periods of said second image signal, respectively, and which correspond to each other in the vertical direction on the television screen are summed and integrated into one sampled image signal element, whereby $N_H$ such sampled image signal elements for each horizontal synchronous period of the second image signal in said mixed image signal are formed from $n \times N_H$ sampled signals of each of said group of n adjacent horizontal synchronous periods of said second image signal and stored by said memory means.

**4,298,892**

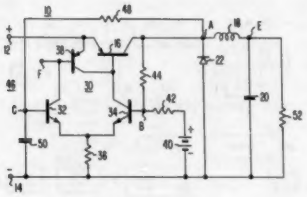
## SWITCHING REGULATOR WITH INDEPENDENT FEEDBACK PATH FILTER

**Howard M. Scott, Moorestown, N.J., assignor to RCA Corporation, New York, N.Y.**

**Continuation of Ser. No. 969,156, Dec. 13, 1978. This application May 27, 1980, Ser. No. 153,398**

**Int. Cl.³ H04N *3/18***

**U.S. Cl. 358—190** **9 Claims**



**1.** A switching regulator adapted for synchronized operation with a television display load apparatus and adapted to be energized from a source of unregulated direct voltage, comprising:

controllable switch means including a control electrode and a main current conducting path defining first and second terminals, said first terminal being coupled to a terminal of the source, said controllable switch means being subject to switching between on and off states to develop at said second terminal an alternating voltage having an average voltage component;

a filter including a choke coupled to said second terminal of said switch means and a capacitor coupled to the load apparatus for energizing said load apparatus with a substantially direct current voltage having a magnitude substantially that of said average voltage component;

a source of a television display horizontal deflection rate sync signal;

means for applying said television display sync signal to said controllable switch means to switch the state of said controllable switch means from a selected one of said on and off states to the other of said on and off states in coincidence with the arrival of said sync signal;

a comparator with a plurality of input terminals and a first output terminal coupled to said control electrode for switching states of said controllable switch means;

a reference voltage source coupled to one of said plurality of comparator input terminals; and

an integrator having an input terminal coupled to said second terminal and an output terminal coupled to one of said plurality of comparator input terminals for averaging said alternating voltage to vary the switching instant of said controllable switch means to the other one of said on and off states so as to maintain said average voltage component substantially unchanged with changes in said unregulated direct voltage.

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**4,298,893**

## T.V. ENERGIZED BY EXERCISE CYCLE

**James H. Holmes, 31 Willis Rd. (P.O. Box 66657), Scotts Valley, Calif. 90566**

**Filed Aug. 29, 1980, Ser. No. 182,436**

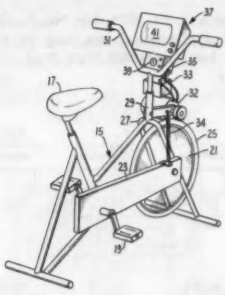
**Int. Cl.³ H04N *3/18***

**U.S. Cl. 358—190** **6 Claims**

**1.** A stationary pedal operated T.V. set including in combination:

a. a television set,

b. a pedal operated electric generator and,



c. means connecting said generator to said television set whereby operating said pedals causes said television set to operate.

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**4,298,894**

## IMAGE PICK-UP TUBE

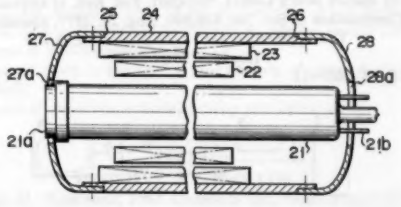
**Yoshio Takamura; Soichiro Abe; Noboru Nakamura, and Hiroyuki Suzuki, all of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan**

**Filed Feb. 8, 1980, Ser. No. 119,847**

**Claims priority, application Japan, Feb. 14, 1979, 54-15672**

**Int. Cl.³ H04N *5/30***

**U.S. Cl. 358—229** **8 Claims**



**1.** An image pick-up tube assembly suitable for use in a color television camera, comprising:

an image pick-up tube having a target provided in the front portion thereof;

a coil assembly surrounding said image pick-up tube;

a cylindrical shield case having front and rear openings therein housing said image pick-up tube and said coil assembly; and

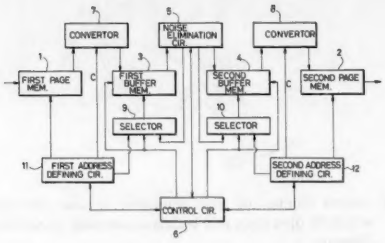
front and rear shielding means for covering the front and rear openings of said shield case, said front shielding means including means for defining an aperture corresponding in location to said target, said front shielding means and said shield case including coupling means formed by a step portion of said cylindrical shield case adapted to interlock with said front shielding means forming a contact therebetween in both horizontal and vertical contact planes.

4,298,895

## VISUAL IMAGE NOISE ELIMINATING SYSTEM

Yoshio Arai; Hiroyuki Kataoka; Isao Suzuki, and Shozo Yokota, all of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Aug. 30, 1979, Ser. No. 71,417
Claims priority, application Japan, Aug. 31, 1978, 53-105621
Int. Cl.[3] H04N *1/40, 5/31*
U.S. Cl. 358—284 7 Claims




1. A method for eliminating noise in a system for recording a visible image on a recording medium in accordance with binary electric image signals produced for each of a plurality of scanning line, comprising the steps of counting one level of two levels of the binary electric image signals corresponding to picture elements in a surrounding area surrounding at least a part of an objective area including at least one picture element and producing an image signal representing the at least one picture element in the objective area as the one level when the percentage of the counted value is more than a predetermined level and as the other level when the percentage of the counted value is less than the predetermined level.

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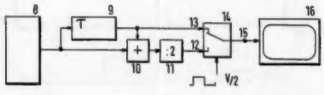
4,298,896

## FLICKER-FREE REPRODUCTION OF TELEVISION PICTURES FROM RECORDINGS OF ONLY ALTERNATE PICTURE LINES

Jürgen Heitmann, Fliederweg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 828,900, Aug. 29, 1977, abandoned.
This application Feb. 2, 1979, Ser. No. 8,973
Int. Cl.[3] H04N *5/76*
U.S. Cl. 360—11 7 Claims




1. A method of reproducing television signals from a record on which are stored television field signals constituting corresponding halves of two-field interlaced television pictures by reproducing said field signals repeatedly, comprising the steps of:

providing the played back signals to a delay circuit having a delay period of one line scan period;

providing to the inputs of an adding circuit, respectively, the delayed output signal of said delay circuit and the currently reproduced played back signal and thereby forming a signal which is an average of the two, thus representing the average value of the two consecutive lines of the same picture field, and

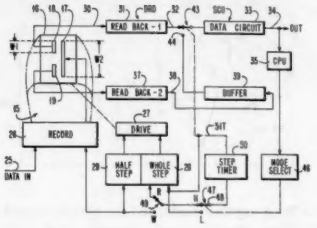
supplying to television picture reproducing circuits in alternate field scan periods, respectively, one of the signals provided to an input of said adding circuit and the average signal formed in the step just previously described.

4,298,897

## BUFFERED RECORDING

Nelson K. Arter, Longmont; Ernest W. Devore; Arthur B. Wills, both of Boulder, all of Colo., and Leslie R. Zelenka, Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 20, 1979, Ser. No. 77,505
Int. Cl.[3] G11B *5/09, 5/12, 21/08, 21/10*
U.S. Cl. 360—39 44 Claims




1. A signal recorder adapted to exchange signals with a record member in any of a first plurality of track widths, the improvements including in combination:

a transducer adapted to scan tracks on a record medium and having a write gap with a first track width for scanning one track of said first width equal to a total width of a first plurality of a second and narrower track width and further having a plurality of read gaps aligned with said write gap along a length of said first width track, and each of said read gaps having a width corresponding to said second track width and being said first track width divided by said first plurality and said gaps being in a side-by-side arrangement for simultaneously scanning a said first plurality of said second width tracks;

track switching means operative during recording signals for switching between predetermined juxtaposed ones of said tracks having said second track widths and operative during reproducing signals to simultaneously switch between juxtaposed groups of said first plurality of tracks equalling said second track width;

means for simultaneously receiving signals from said read gaps which simultaneously scan said first plurality of said tracks having said second track width; and

means for serializing all signals produced from said simultaneous sensing.

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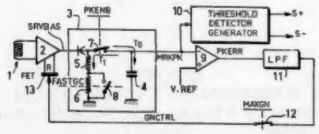
4,298,898

## METHOD OF AND APPARATUS FOR READING DATA FROM REFERENCE ZONES OF A MEMORY

Claude R. Cardot, Lexington, Mass., assignor to Compagnie Internationale Pour l'Informatique CII Honeywell Bull, Paris, France

Filed Apr. 19, 1979, Ser. No. 31,458
Int. Cl.[3] G11B *5/02, 5/09*
U.S. Cl. 360—67 47 Claims




1. An apparatus for reading data with a magnetic head from reference zones on tracks at differing radii of a magnetic memory disc rotating at constant angular velocity, each track including at least one reference zone, each reference zone includ-

ing a plurality of initial cells each having magnetic flux variations which when read by the head result in a first waveform that includes undulations enabling the head to be properly servo controlled to a position over the center of the track and a further undulation that is distinguishable from the head positioning undulations, the initial cells being followed by plural binary bit representing data cells each having magnetic flux variations which when read by the head result in a second waveform including a data representing undulation that is approximately the same amplitude as the further undulations, the undulations susceptible of having varying amplitudes as the head is positioned at different positions on the disc, comprising a variable gain means responsive to the head, means responsive to the peak amplitudes of the further undulations of a reference zone for setting the gain of the variable gain means while the second waveforms of the reference zone are being applied to the variable gain means, the peak amplitudes of the initial and data cells as derived from the variable gain means for differing reference zones being variable and dependent upon the amplitude of the peak amplitude of the further undulations for a reference zone, means responsive to the variable peak amplitude of the further undulations for a reference zone for setting an amplitude threshold for the peak values of the second waveforms of that zone, and means responsive to the set amplitude threshold and an output of the variable gain means while the second waveforms are being applied to the variable gain means for determining the values of the data cells.

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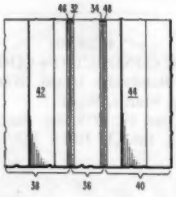
**4,298,899**

## MAGNETIC HEAD ASSEMBLY WITH FERRITE CORE

**Armando J. Argumedo, Tucson, Ariz.; George W. Brock, Los Altos Hills, Calif., and Paul D. Losee, Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Dec. 17, 1979, Ser. No. 103,968**
**Int. Cl.³ G11B 5/22, 5/42**
**U.S. Cl. 360—122** **6 Claims**



1. A magnetic head assembly including a ferrite core having two sides and a transducing gap between said sides, wherein the improvement comprises:

first and second ceramic structures disposed respectively on each side of said core;

first and second alumina films disposed on each side of and in contact with said core;

third and fourth alumina films deposited respectively on one side of and in contact respectively with said ceramic structures; and

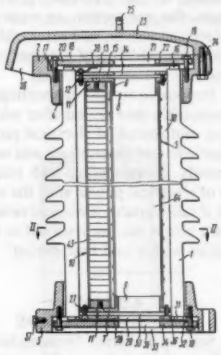
means for bonding said first and third alumina films and said second and fourth alumina films to form a sandwich structure around said ferrite core.

**4,298,900**

## OVERVOLTAGE PROTECTIVE DEVICE

**Boris K. Avdeenko, prospekt Lunacharskogo, 70, korpus 1, kv. 55; Aron I. Bronfman, ulitsa Burenina, 3, kv. 108; Alexandr L. Vitkin, ulitsa Krasnoi Konnitsky, 18, kv. 1; Boris N. Zelentsov, Liteiny prospekt, 24, kv. 31, all of Leningrad; Valery N. Kinevsky, ulitsa Chernyshevskogo, 96, kv. 71, Kharkov, and Vladimir E. Rozet, Kljuchevaya ulitsa, 21, kv. 20, Leningrad, all of U.S.S.R.**

**Filed Jan. 2, 1980, Ser. No. 109,112**
**Int. Cl.³ H02H 3/22**
**U.S. Cl. 361—127** **5 Claims**



1. An overvoltage protective device comprising:

an insulating housing;

at least one column of non-linear resistors arranged inside said insulating housing;

a dielectric bush having a housing and arranged inside said insulating housing;

thermally conductive dielectric bulk material closely enveloping said column of non-linear resistors and said dielectric bush, said thermally conductive dielectric bulk material also being in contact with the inner surface of said insulating housing;

a gas vent channel defined by the inner surface of said dielectric bush and arranged lengthwise in relation to said column of non-linear resistors;

openings made in the wall of said housing of said dielectric bush;

a layer of dielectric material closing said openings.

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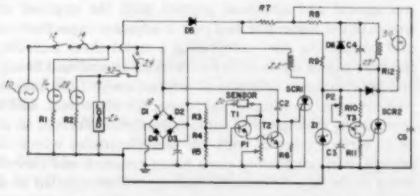
**4,298,901**

## RESISTIVE CONTROLLER

**Marvin H. Weintraub, 5743 Kingsfield Dr., West Bloomfield, Mich. 48033, and Fred Oblinger, 31610 Delaware, Livonia, Mich. 48150**

**Filed Apr. 30, 1979, Ser. No. 34,609**
**Int. Cl.³ H01H 47/32**
**U.S. Cl. 361—178** **14 Claims**



1. A resistive controller adapted to be connected to a source of electrical power for sensing a variable electrical resistance

indicative of a selected characteristic of a first substance, said resistive controller comprising:

sensor means, adapted to be disposed in said substance to be monitored, for sensing a variable electrical resistance indicative of said selected characteristic of said substance;

first electrical switch means;

means, operable in conjunction with said sensor means, for actuating said first electrical switch means when the resistance sensed by said sensor means reaches a predetermined level, said predetermined level of resistance being set by said actuating means;

means, responsive to the actuation of said first electrical switch means, for connection an external load to said source of electrical power, said external load being operative to control the addition of a second substance to said first substance;

timer means, responsive to said connecting means, for providing an adjustable time period after said external load is connected to said source of electrical power; and

means, responsive to said timer means and said sensor means, for permanently disconnecting said external load from said source of electrical power after the expiration of said time period if said variable electrical resistance measured by said sensor means has not returned to a predetermined range of values within said time period.

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## 4,298,902
## CAPACITOR CASCADE

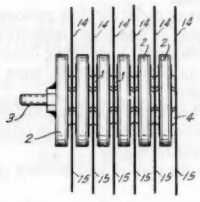
**Helmut Weigel, Selb, and Werner Wollenschläger, Wunsiedel, both of Fed. Rep. of Germany, assignors to Draloric Electronic GmbH, Fed. Rep. of Germany**

**Filed Jun. 18, 1979, Ser. No. 49,108**

**Claims priority, application Fed. Rep. of Germany, Dec. 7, 1978, 2853503**

**Int. Cl.³ H01G 4/38**

**U.S. Cl. 361—328** **17 Claims**



**1**. A capacitor cascade comprising:

a columnar array of ceramic disk capacitors, each said capacitor comprising a ceramic disk with opposite surfaces and a respective metal electrode on each said opposite surface, a said electrode of each said capacitor in said array being opposed to a said electrode of an adjacent said capacitor in said array;

a respective metallic connecting part being interposed between each pair of adjacent said disk capacitors for connecting said capacitors in series and each said connecting part being in mechanical and electrical contact with the opposed electrodes of the respective said pair of adjacent capacitors, each said connecting part comprising a metal sheet including a flat base part, a series of feet developed around said base part and projecting in opposite directions away from said base part towards the adjacent said capacitor electrodes, said feet terminating in respective contact portions deformed so as to be in surface contact with the said electrodes which they engage, said connecting parts being resilient, and therefore being resiliently deformable under pressure applied to said columnar array; and

means for fastening said columnar array of said capacitors together with said connecting parts between adjacent said capacitors, said fastening means applying axial force for holding said columnar array together.

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## 4,298,903
## ELECTRONIC COMPONENT COOLING ARRANGEMENTS

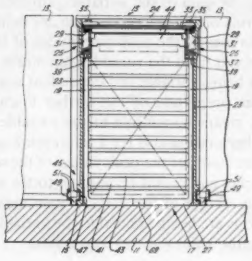
**Stafford M. Ellis, East Preston, England, assignor to The General Electric Company Limited, London, England**

**Filed Jun. 22, 1979, Ser. No. 50,972**

**Claims priority, application United Kingdom, Jun. 29, 1978, 28252/78**

**Int. Cl.³ H05K 7/20**

**U.S. Cl. 361—386** **9 Claims**



**1**. An electronic component cooling arrangement comprising:

(a) a cold wall;

(b) a wall structure in the form of a box open at one end in releasable contact at its open end with the cold wall to form a housing;

(c) a card within the housing;

(d) a plurality of electronic components mounted on the card;

(e) a heat conductive support frame within said housing having transverse side and end members and which supports said card with the components mounted on the card in good thermal contact with the frame;

(f) a guide arrangement within the housing receiving said side members of the frame; and

(g) preloaded spring bias means which is mounted on the wall structure and urges the support frame along said guide arrangement so that a said end member of the frame is in good thermal contact with the cold wall.

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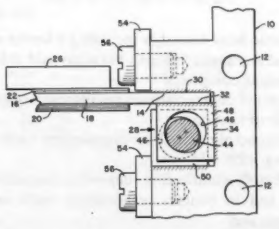
## 4,298,904
## ELECTRONIC CONDUCTION COOLING CLAMP

**Philip C. Koenig, Bainbridge Island, Wash., assignor to The Boeing Company, Seattle, Wash.**

**Filed Dec. 17, 1979, Ser. No. 104,643**

**Int. Cl.³ H05K 7/20**

**U.S. Cl. 361—386** **3 Claims**



**1**. A device comprising a clamp mounting an edge portion of a printed circuit board into a channel guide having interior

opposing wall surfaces and an interconnecting wall surface, said device comprising: an elongated bar assembly of rectangular cross-section and having lengthwise a series of end-to-end bar segments with a hole extending longitudinally therethrough; a bolt having a head, a shank threaded at its end portion and being inserted through said hole in the elongated bar assembly; said elongated bar assembly having end bar segments at each end thereof wherein said hole is parallel offset from the longitudinal centerline of each of said end bar segments; one of said end bar segments being located at the head end of said bolt and having a hole diameter approximately equal to that of the bolt shank diameter for a close sliding fit; the other of said end bar segments being located at the shank end of said bolt and having a threaded hole for screwing onto the threaded shank end portion of said bolt; intermediate bar segments, between said head end bar segment and said shank end bar segment, wherein said hole is coaxial with the longitudinal centerline of said intermediate bar segments and of a substantially larger diameter than the shank diameter of said bolt extending therethrough; said intermediate bar segments, comprising in alternate series, a first set and a second set of intermediate bar segments having end facing surfaces abutting along an inclined plane such that said first and second set of intermediate bar segments spread divergently apart with their longitudinal centerlines remaining parallel to the bolt axis upon screwing the bolt into said threaded shank end bar segment and drawing the end bar segments tightly together; said first set of intermediate bar segments applying a force against said printed circuit board edge portion pressing it firmly against a first interior opposing wall surface of said channel guide and simultaneously bearing against the interconnecting wall surface of said channel guide; said second set of intermediate bar segments bearing against a second interior opposing wall surface of said channel guide; whereby said first set and said second set of intermediate bar segments provide a contact area with each of the interior wall surfaces of said channel guide thereby producing three thermal conductive paths between said printed circuit board edge portion and said channel guide.

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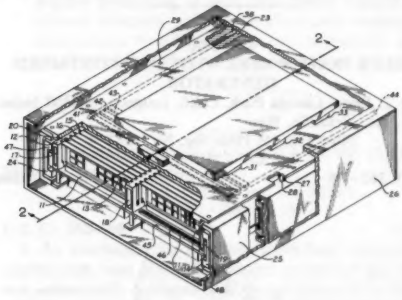
**4,298,905**

## COOLING APPARATUS FOR ELECTRONIC MODULES

**Alan J. Bosler, Bedford, and Larry E. Nash, Washington, both of Ind., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Feb. 19, 1980, Ser. No. 122,388**
**Int. Cl.³ H05K** *7/20*
**U.S. Cl. 361—386** **8 Claims**



1. A modular electronic system comprising,
a case having a top, bottom and a plurality of sides,
a support assembly slidably mounted in said case and having at least two side plates, each having a plurality of spaced grooves therein,
spring means in each said groove,
a plurality of electronic modules each having a metallic frame with the ends of each said metallic frame being slidably mounted in opposed grooves in said side plates and supported by said spring means,
a metallic top plate positioned between said top of said case and said metallic frames of said electronic module,
means for moving said top plate into engagement with each frame of each electronic module whereby said spring means are depressed and provide a biasing force to engage said frames with said metallic top plate, and
means for cooling said side plates and said metallic top plate.

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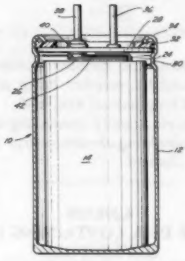
**4,298,906**

## CAPACITOR AND ELEMENT THEREFOR

**William H. Elias, Six Mile, S.C., assignor to Sangamo Weston, Inc., Norcross, Ga.**

**Filed Sep. 10, 1979, Ser. No. 74,177**
**Int. Cl.³ H01G** *9/00*
**U.S. Cl. 361—433** **3 Claims**



1. A capacitor comprising: a cylindrical case open at one end and closed at the other; a cylindrical header for closing said open end of said cylindrical case and including first and second leads spaced apart across a diameter of said cylindrical header; a first cylindrically rolled spacer film disposed in said cylindrical case; a cylindrically rolled cathode film abutting and encircled by said first cylindrically rolled spacer film; a second cylindrically rolled spacer film abutting and encircled by said cylindrically rolled cathode film; a cylindrically rolled anode film abutting and encircled by said second cylindrically rolled spacer film; a first tab conductively connected to and extending from said cylindrically rolled cathode film at a predetermined circumferential position and bendable across a diameter of said cylindrically rolled cathode film parallel to said diameter of said cylindrical header, said first tab operatively and conductively connected to said first lead and parallel to said diameter of said cylindrical header; a second tab conductively connected to and extendeing from said cylindrically rolled anode film proximate said predetermined circumferential position of said first tab at said cylindrically rolled cathode film and bendable across said diameter of said cylindrically rolled cathode film, said second tab overlapped by and longer than said first tab, said second tab extending beyond said first lead and conductively connected to second lead; and insulator spacer means disposed around said second lead and interposed between said first and second tabs to prevent contact therebetween.

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**4,298,907**

## FLASH ATTACHMENT WITH EXTENDABLE HEAD

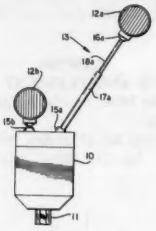
**Raymond B. Holt, Jr., 3341 Gulfstream La., Marietta, Ga. 30062**

**Filed Sep. 10, 1979, Ser. No. 73,848**
**Int. Cl.³ G03B** *15/02*
**U.S. Cl. 362—4** **8 Claims**

1. In a flash attachment comprising a body, mounting means connected to said body for fixedly securing said flash attachment to a camera, said body containing a discharge circuit and power supply means for providing electric charge to said

discharge circuit, a flash head including a light-emitting discharge element; the improvement of

an extendable member connecting said flash head and said body, said extendable member defining a longitudinal axis running between a first point at which said extendable member connects to said body and a second point at



which said extendable member connects to said flash head, said extendable member being selectively extendable along said longitudinal axis, and

conducting means electrically connecting said body and said flash head for supplying electric charge to said light-emitting discharge element.

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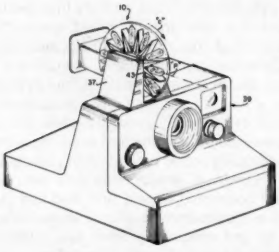
**4,298,908**

## FLASHLAMP DISK CONTAINING INTERNAL REFLECTORS

**George J. English, Reading; Robert E. Levin, South Hamilton, and Timothy Fohl, Carlisle, all of Mass., assignors to GTE Products Corporation, Stamford, Conn.**

**Filed Jun. 8, 1979, Ser. No. 46,874**
**Int. Cl.³ G03B** *15/02*
**U.S. Cl. 362—14** **12 Claims**



1. In a flashlamp unit including a disk-shaped, light-transmitting housing having a central axis, and a plurality of flashlamps each having a longitudinal axis and arranged within said housing in a radial pattern about said central axis such that said longitudinal axes of said flashlamps pass through said central axis, wherein said flashlamp unit is adapted for cooperating with an indexing means for rotating said housing about said central axis to selectively position each of said flashlamps at a first, stationary location with respect to said indexing means, the improvement comprising:

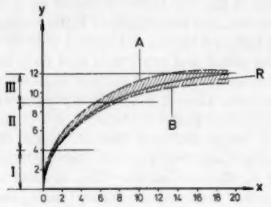
a plurality of reflectors, each of said reflectors including first and second substantially planar reflective members positioned within said disk-shaped housing adjacent a respective one of said flashlamps and on opposing sides thereof for reflecting a portion of the light emitted from said flashlamp upon ignition thereof through the peripheral region of said light-transmitting housing and for preventing sympathetic ignition between said flashlamp and flashlamps adjacent thereto.

**4,298,909**

## PHOTOFLASH REFLECTOR CONFIGURATION

**Rudolf Krieg, Munich, Fed. Rep. of Germany, assignor to Patent-Treuhand-Gesellschaft fur elektrische Gluhlampen mbH, Munich, Fed. Rep. of Germany**

**Filed Jun. 13, 1979, Ser. No. 48,039**
**Claims priority, application Fed. Rep. of Germany, Jul. 10, 1978, 2830321**
**Int. Cl.³ G03B** *15/02*
**U.S. Cl. 362—18** **10 Claims**




1. Selectively adjustable multi-beam electronic photographic flash having

a single elongated flashtube (2);

and a reflector assembly (**4**, **5**, **6**) partially surrounding the flashtube and including a plurality of reflector elements of which at least one reflector element is pivotable with respect to another reflector element about an axis parallel to the elongated flashtube, to selectively direct light flashes from the tube to selective directions,

wherein, in accordance with the invention, the reflector elements have a curvature which lies in the area (R) between curves defined by equations A and B herein:

$$A: y^2 = 13{,}4 \times -0{,}3722\, x^2 \text{ with } 0 < y < 12{,}3 \text{ and}$$
$$B: y^2 = 18 \times -0{,}5233\, x^2 \text{ with } 0 < y < 11$$

and wherein the curvature of the reflector elements, at values of y at the lower end of the range is close to the curve defined by equation B, and said curvature of the reflector element varies smoothly within said area (R) to approach the curve defined by equation A as the value of y increases towards the upper end of its range.

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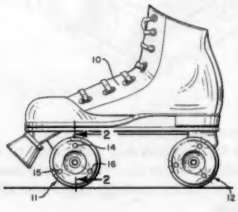
**4,298,910**

## ROLLER SKATE WHEEL WITH SELF-CONTAINED GENERATOR

**Robert T. Price, Canoga Park, Calif., assignor to RJM Industries, Inc., Franklin, Wis.**

**Filed Feb. 19, 1980, Ser. No. 122,674**
**Int. Cl.³ F21L** *13/00*
**U.S. Cl. 362—35** **4 Claims**



1. A roller skate wheel including, in combination:

(a) an inner stationary body for securement to a roller skate axle;
(b) an outer body surrounding said inner stationary body;
(c) bearings rotatably mounting said outer body to said stationary body;
(d) at least two light emitting means incorporated in said outer body for emitting light from the outboard side of the outer body of said skate wheel when energized;
(e) a permanent magnet secured to said inner body; and
(f) electrically conducting windings embedded in said outer body and connected to said light emitting means, said windings being in magnetic flux coupling relationship with said permanent magnet so that upon rotation of said outer body, alternating current is generated in said windings for energizing said light emitting means.

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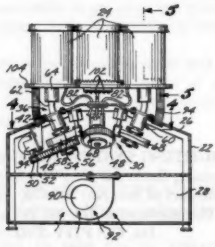
**4,298,911**
**LIGHTING DEVICE FOR CREATING PUBLIC ATTRACTION**
**Richard T. Headrick, Irvine, Calif., assignor to Pichel Industries, Inc., Rancho, Calif.**
**Continuation-in-part of Ser. No. 98,864, Nov. 30, 1979, abandoned. This application Apr. 28, 1980, Ser. No. 144,369**
**Int. Cl.³ F21V *21/30***
**U.S. Cl. 362—35** **43 Claims**



1. A lighting device comprising:
a base;
a plurality of light sources, each light source being mounted to the base;
first means mounted to the base for individually varying angular positioning of each light source relative to the vertical direction and for simultaneously causing each light source to orbit a respective centerpoint without causing rotation of each light source about an axis.

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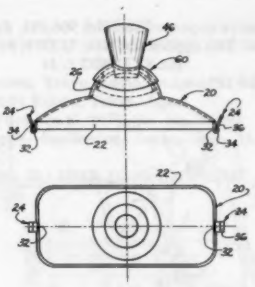
**4,298,912**
**ATTACHMENT FOR A VEHICLE DOME LIGHT**
**Miles B. Dearth, Columbus, Ohio**
**Filed Oct. 9, 1979, Ser. No. 82,982**
**Int. Cl.³ B60Q *1/06***
**U.S. Cl. 362—66** **8 Claims**

1. An attachment for a vehicle dome light comprising, in combination, base means including a peripheral base portion that substantially conforms with the periphery of the frame of said dome light, and a central spherical portion provided with a spherical inner surface, a spherical outer surface, and a central opening; mounting means on said base means for detachable engagement with said dome light frame; and ligl.t transmitting means moveably mounted on the base means for directing a path of light therefrom and including an outwardly facing surface confronting said inner spherical surface, an inwardly facing surface confronting said outer spherical surface, and a shank portion extended freely through said central opening of the base means to permit articulation of the light transmitting means relative to the base means in all radial directions about



a common center for said spherical surfaces so as to vary the angle of said path of light.

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**4,298,913**
**ILLUMINATING APPARATUS**
**Michael J. Lozar, 835 W. Magnolia, Auburn, Ala. 36830**
**Filed Nov. 21, 1979, Ser. No. 96,537**
**Int. Cl.³ F21L *15/08***
**U.S. Cl. 362—103** **20 Claims**

1. An illuminating apparatus comprising:
(a) a battery pack;
(b) a cable electrically connected to and leading from said battery pack; and
(c) a lamp element having a bulb housing, a bulb in said housing for electrically connecting to said cable, and a clip connected to said bulb housing, said clip having a pair of spaced opposed clip members with opposed friction surfaces defining a rearwardly opening slot, said clip members being yieldable with respect to each other for frictionally engaging opposite surfaces of a plate on which the illuminating member is to be mounted.

**4,298,914**

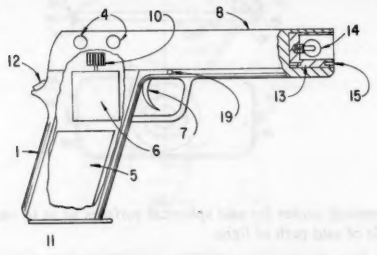
## ELECTRIC FIRING DEVICE

**Alvin L. Long, Civilian Gen. Del., Beale Air Force Base, Calif. 95903**

**Continuation-in-part of Ser. No. 906,092, Jun. 23, 1978, abandoned. This application Nov. 5, 1979, Ser. No. 91,553**

**Int. Cl.³ F41C *1/34***

**U.S. Cl. 362—112** **1 Claim**




1. In a electric firing device for firing rockets, said firing device being inherently capable of being used for firing rockets from a mortar tube, and having batteries and triggering device, said firing device having a sighting device attached, in combination with a hand held electric generator, and a light projecting unit for automatic pistols, what is new comprizing:

A. an attachable electric firing device with a simila size and construction of a military 45 caliber automatic pistol, containing a battery and generator,

B. said battery and generator being contained in a removable magazine like container,

C. a slide portion on top of the pistol shaped electric firing device that will activate the electric generator when worked back and forth,

D. a trigger switch on said firing device for supplying a electric pulse from the battery or generator,

E. a removable light projecting unit contained in a muzzle cavity of the electric firing device, said unit having external and internal female electric plugins,

F. a lug groove extending along the full length of the top portion of the slide for attaching to a weapon,

G. a lug groove extending along the full length of the side portion of the slide for attaching a suitable sight,

H. a pistol shaped electric firing device applied to a high angle of fire mortar tube, said mortar tube having its breech cap removed to fire rockets horizontally,

I. electric terminals on the side of the piston shaped electric firing device for attaching trailing wires from any explosive device or weapon that can be fired by a electric pulse.

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**4,298,915**

## NIGHT LIGHT APPARATUS

**Adolph E. Goldfarb, 4614 Monarca Dr., Tarzana, Calif. 91356, and Elonne Dantzer, Redondo Beach, Calif., assignors to Adolph E. Goldfarb, Tarzana, Calif.**

**Filed Feb. 9, 1979, Ser. No. 10,923**

**Int. Cl.³ F21P *1/02***

**U.S. Cl. 362—124** **19 Claims**

1. A night light apparatus for a child comprising:

(a) means defining a representation of at least a portion of a figure, including a three-dimensional contoured face made of opaque material;

(b) movable means movably supported on said figure-defining means and defining a representation of an extremity of the figure, said movable means including means for supporting a light source, said movable means being movable between a first position and a second position; and

(c) electrical circuit means on said figure-defining means and electrically connected to said light source support means, said circuit means including an off/on switch operatively associated with said movable means so that said switch is on when said movable means is in said first position and said switch is off when said movable means is in said second position, said movable means being proportioned and configured so that when said movable means is in said

first position and said switch is on, the light source is in close proximity to the face and so positioned relative to the face that the light from the light source will fully illuminate the face without creating any significant amount of shadow on said face.

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**4,298,916**

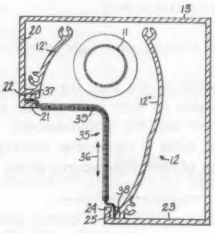
## LIGHTING SYSTEM WITH BAFFLE

**Sylvan R. Shemitz, Sunbrook Rd., Woodbridge, Conn.**

**Continuation-in-part of Ser. No. 783,676, Apr. 1, 1977, Pat. No. 4,173,034. This application Jul. 26, 1977, Ser. No. 819,067**

**Int. Cl.³ F21V *5/02***

**U.S. Cl. 362—127** **4 Claims**



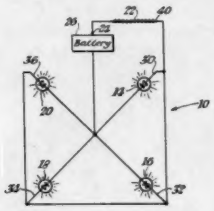

1. A task-oriented lighting system for use with a task supported in a substantially horizontal position and adapted to be viewed from a first direction and from an observation point located at elevations between sitting eye height and standing eye height, comprising an elongated light source having its long axis substantially perpendicular to said first direction, said light source being an element of a luminaire which includes a housing and at least one reflector, the housing being provided with at least one slot disposed parallel to the axis of the light source and the system including a baffle interposed between the light source and the task and extending laterally far enough to intersect most vertical planes passing through the observation point and the task, the baffle being mounted in said slot and laterally adjustable therealong, whereby light from the source which could cause veiling reflections from the task is intercepted.

4,298,917

## MOTION LIGHT DEVICE

Donna L. Ware, 8001 SW. Fifth St., North Lauderdale, Fla. 33068

Filed Nov. 1, 1979, Ser. No. 90,427
Int. Cl.[3] F21L 7/00
U.S. Cl. 362—157 6 Claims




1. A signaling system comprising:
at least one signaling means having a first terminal connectable to an electrical power source and a second terminal,
said signaling means for providing an indication of movement in any direction,
a switching means having a first end and second end, said second end connected to said second terminal,
said first end connectable to an electrical power source,
said switching means includes interconnected conductive links,
said switching means for providing make and break electrical contact responsive to movement of said signaling system in any direction for providing electrical switching of said signaling means.

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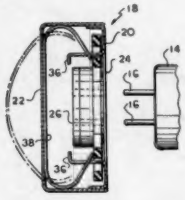
4,298,918

## FLUORESCENT FIXTURE SOCKET

Paul T. Metcalf, II, Methuen, Mass., assignor to Keene Corporation, New York, N.Y.

Filed Jun. 13, 1980, Ser. No. 159,370
Int. Cl.[3] F21S 3/00
U.S. Cl. 362—217 6 Claims



1. A fluorescent fixture socket assembly comprising:
a housing having front and rear surfaces;
an opening in said front surface;
a fluorescent terminal mounted within said housing and accessible through said opening, said terminal including a body portion containing a pair of fluorescent tube contacts and having a pair of holes extending therethrough on opposite sides of said contact;
a pair of posts secured or formed within said housing to said front surface and extending rearwardly on opposite sides of said opening, said posts each passing through one of said body portion holes whereby said terminal floats on said posts; and,
a strip of flat spring material having opposite end portions and a center portion, said end portions each engaging said terminal body portion and said center portion engaging said housing rear surface whereby said spring material resiliently biases said terminal toward said housing front surface.

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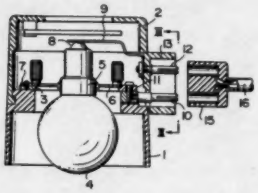
4,298,919

## LAMP HOUSE STRUCTURE FOR ILLUMINATION DEVICES

Yukinori Karasawa, Tokyo, Japan, assignor to Tokyo Kogaku Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 5, 1979, Ser. No. 72,693
Claims priority, application Japan, Sep. 11, 1978, 53-124445[U]
Int. Cl.[3] H01R 33/00; F21V 25/00
U.S. Cl. 362—226 3 Claims



1. A lamp house for an illuminating device, which comprises a body, a cap which is adapted to be detachable attached to the body, means for mounting at least one illumination lamp, at least a pair of electrically conductive jacks respectively connected with said lamp and adapted to be mechanically and electrically engaged with a connector element for a power supply cable, one of said jacks being securely mounted on said body and the other being securely mounted on said cap such that removal of said cap from said body is prevented when the jacks are engaged with said connector element.

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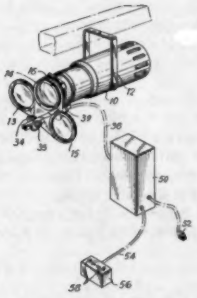
4,298,920

## AUTOMATIC GEL CHANGER FOR A SPOTLIGHT

Lewis Gluck, 391 W. Jericho Turnpike, Huntington, N.Y. 11743, and Robin M. Tannenbaum, 90 Bedford St., New York, N.Y. 10001

Filed Jun. 7, 1979, Ser. No. 46,296
Int. Cl.[3] F21V 7/00
U.S. Cl. 362—281 4 Claims



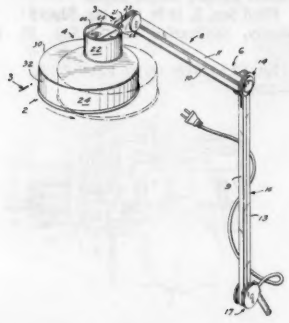
1. A remote gel changer for a spotlight, emitting a beam of light, comprisng a gel frame for motion between a removed position and a position for intercepting said beam of light, rotary solenoid means for causng said motion of said frame, electrical means for operating said solenoid, remote switch means for causing said electrical operation and a damper connected to said frame for providing smooth motion of said frame as caused by said rotary solenoid.

**4,298,921**

## LAMP

**Jens C. Krogsrud, Oslo, Norway, and Kai O. Soerensen, Lyngby, Denmark, assignors to Jac. Jacobsen A/S, Oslo, Norway**

**Filed Oct. 23, 1979, Ser. No. 87,482**
**Claims priority, application Norway, Oct. 24, 1978, 783593**
**Int. Cl.³ F21V *7/00***
**U.S. Cl. 362—346** **11 Claims**



**1.** In a lamp structure, the combination of, a lamp head assembly which is adapted to be supported in a position over a work area and provide substantially uniform lighting with the light being directed from a generally horizontally extending zone, and support means for said lamp head, said lamp head comprising a shade which is generally circular in plan, a reflector assembly mounted in said shade, and light source means, said shade and support means having mating rotatably engaged portions, said mating portions of said shade and said support means being eccentrically located with respect to said shade, said shade having an opening therethrough at said mating portions and said light source means comprising a lamp bulb mounted in a socket in said support means above said central opening and extending therethrough to a position within said reflector assembly, said reflector assembly having a plurality of flat faceted reflecting surfaces located at predetermined angles with respect to each other and to said bulb to reflect light from said bulb evenly over said area in an oval pattern extending from directly beneath the lamp shade to a position which is a substantial distance away from the shade; said faceted surfaces of the shade defining three groups of facets including a first group of polygonal facets extending from positions adjacent said shade opening downwardly away from said opening towards the peripheral edge of the shade remote from said opening and at a transverse angle to each other, a second group comprising a single facet lying in a plane parallel to the plane of said opening partially surrounding said opening and extending away therefrom in a direction opposite to said first group of facets, and a third group of flat polygonal facets spaced from said opening and extending downwardly at slight angles to the vertical; said third group of facets being located on the side of said opening opposite said first group of facets with at least some of said facets in the third group extending to the side of the opening on which the first group is located.

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**4,298,922**

## ROTATABLY ADJUSTABLE TROUBLE LAMP SHIELD

**Cret E. Hardwick, 2420 "B" St., Box 922, Baker, Oreg. 97814**

**Filed Nov. 2, 1979, Ser. No. 90,586**
**Int. Cl.³ F21V *15/00***
**U.S. Cl. 362—376** **12 Claims**

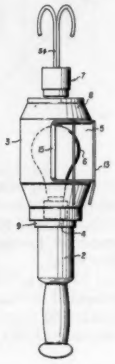
**1.** A rotatably adjustable light shield for shielding and suspending a portable trouble lamp of the type having an elongated handle with an electric light mounted on one end, comprising:

(a) a shield member for substantially enclosing said electric light of said lamp, said shield member having a top end and a bottom end and an aperture on one side for the transmission of light therethrough;

(b) a mounting means attached to the bottom end of said shield member for mounting said shield member onto said light bearing end of said trouble light handle;

(c) a rotatably adjustable suspension means mounted onto the top end of said shield member for providing a rotatably adjustable suspension mount for said shield member, including:

(i) a plate having a circular array of regularly spaced detent cavities mounted onto the top end of said light shield;



(ii) a detent ball retainer rotatably mounted over said plate and having at least one detent ball receivable into each of said detent cavities for retaining said light shield in any of the angular positions associated with each of said detent cavities and for transmitting a tactile indication of the amount of rotary adjustment made when said light shield is mounted onto a trouble lamp and said handle of said trouble lamp is manually rotated relative to said suspension means, and

(iii) a suspension hook assembly mounted onto said detent ball retainer for suspending said trouble lamp.

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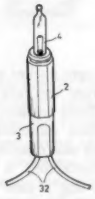
**4,298,923**

## ASSEMBLED FUSE LAMPHOLDER OF LIGHT SET

**Shong D. Lin, No. 42, Chu-Wei Tsi, Ho-Ping Rd., Hsin-Chu City, Taiwan**

**Filed Aug. 2, 1979, Ser. No. 63,097**
**Int. Cl.³ F21P *1/02***
**U.S. Cl. 362—392** **3 Claims**



**1.** A holder for a decorative light bulb comprising:

a cylindrical sleeve for receiving said bulb at one end thereof;

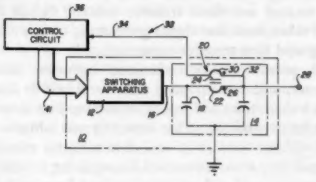
a fuse seat mounted within said sleeve and having first and second electrical fuse conduction paths therethrough connecting to said bulb when received in said sleeve; and

a base extending into the other end of said sleeve for mounting electrical connections to electrically connect to said conduction paths so that current is supplied to said bulb via said conduction paths.

## 4,298,924
## SWITCHING REGULATOR CIRCUIT WITH PHASE SHIFT SUBTRACTION

**Luther L. Genuit, Scottsdale, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.**

**Filed Oct. 1, 1979, Ser. No. 80,642**
**Int. Cl.³ H02P *13/18***
**U.S. Cl. 363—46** **2 Claims**




1. An apparatus for stabilizing a switching regulator circuit having a choke located at the output thereof, comprising:

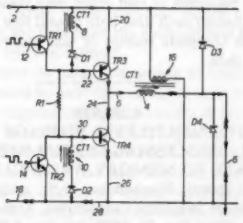
a. sensing winding connected to the output of said switching regulator circuit in magnetic communication with said choke for subtracting the phase shift thereacross from the output of said switching regulator circuit to produce a feedback signal; and

b. a control circuit operatively connected to receive said feedback signal and to produce control signals to said switching regulator circuit in response thereto whereby said control circuit stabilizes said switching regulator circuit and including an output terminal connected to receive the output of said switching regulator circuit and wherein said choke includes an electrically conductive slug connected in series with the output of said switching regulator circuit with one end connected to said output terminal; at least one magnetically conductive ring disposed about said slug to form a core; and a wire disposed within said slug and electrically insulated therefrom, one end of said wire being connected to said output terminal, said wire extending from said one end thereof through said slug from said one end of said slug toward another opposite end thereof.

## 4,298,925
## TRANSISTORIZED INVERTOR

**John R. Melling, Gosport, England, assignor to Plessey Handel und Investments AG, Zug, Switzerland**

**Filed Jul. 10, 1979, Ser. No. 56,261**
**Int. Cl.³ H02M *7/537***
**U.S. Cl. 363—131** **4 Claims**



1. A transistorised invertor for inverting direct current to at least one phase of alternating current so as to provide an output current of said invertor, said invertor having an input line and an output line, comprising:

a current transformer having a primary in said output line of the invertor, and having at least one pair of secondaries, one pair of secondaries for each said at least one phase, said at least one pair of secondaries including first and second secondaries;

at least one pair of base drive circuits, one pair of base drive circuits for each said at least on phase, said at least one pair of base drive circuits including first and second base drive circuits which respectively include said first and second secondaries of the current transformer; and

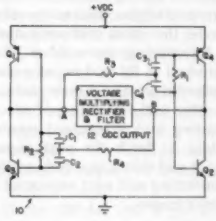
at least one pair of transistors, one pair of transistors for each of said at least one phase, each pair of transistors including first and second main transistors, each said first and second main transistors having a base;

said first and second secondaries being connected to the base of said first and second main transistors, respectively, said current transformer feeding a proportion of the output current of the invertor, via said first and second secondaries, to the base of said first and second main transistors, respectively, in order to provide base drive current thereto, said invertor including a respective diode associated with each secondary and connected thereto for preventing reverse current from passing through said each secondary.

## 4,298,926
## POWER CONVERTER

**James M. Black, Quartz Hill, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.**

**Filed Jun. 29, 1979, Ser. No. 53,652**
**Int. Cl.³ H02M *7/537, 7/25***
**U.S. Cl. 363—132** **8 Claims**



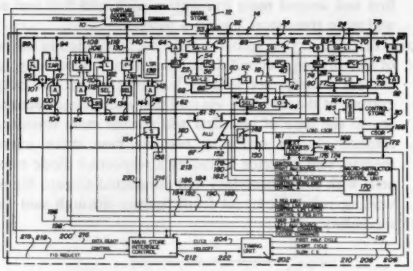

1. A converter having four transistors interconnected at four junctions to form a four-sided bridge circuit, with one transistor on each of the four sides of the bridge, and means for alternately turning on and off said transistors in pairs on opposite sides so that an AC voltage is obtained from one pair of opposite junctions while a DC voltage is applied to the remaining pair of junctions, one of said switches in each pair being of one conductivity type and the other of said switches in each pair being of opposite conductivity type, with transistors connected to common DC junctions being of the same conductivity type, said means for alternately turning on and off said transistors comprising RC timing circuits cross coupling control terminals of said transistors with control terminals of both transistors in adjacent sides of said bridge being AC coupled to an AC junction on the opposite side of said bridge, each of said RC timing circuits being comprised of a resistor connected between control terminals of said transistors on adjacent sides of said bridge, two capacitors connected in series between control terminals of said transistors on adjacent sides of said bridge, and a resistor connected between the AC junction on the opposite side of said bridge and a junction between said series connected capacitors, whereby said transistors connected in a bridge circuit are operated in a free running multivibrator mode for converting said DC voltage to AC voltage.

**4,298,927**

## COMPUTER INSTRUCTION PREFETCH CIRCUIT

**Neil C. Berglund, Kasson; William G. Kempke, and William C. Richardson, both of Rochester, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Oct. 23, 1978, Ser. No. 954,068**
**Int. Cl.³ G06F *9/22***
**U.S. Cl. 364—200** **29 Claims**



1. A prefetch circuit for retrieving sequentially stored user instruction codes from a main store of a digital computer prior to use by a computation unit of the computer, the computer including a control store having a collection of microinstructions which are selectively called up by user instructions and decoded for execution by the computation unit and a main store control which generates the instruction code address for the next instruction codes to be retrieved for use by the computation unit, comprising in combination,

(a) register means for storing instruction codes retrieved from the main store, said register means connected to deliver the instruction codes therein to said computation unit,

(b) means for determining the number of main store fetch operations required to fill said register means with instruction codes retrieved from said main store, and

(c) means responsive to the decoding of selected microinstructions for initiating said determined number of main store fetch operations to fetch the next sequential instruction codes starting at said instruction code address from the main store and transferring said next sequential instruction codes into said register means.

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**4,298,928**

## DATA TRANSFER SYSTEM FOR DATA EXCHANGE BETWEEN TWO OPERATION PROCESSORS

**Kunihiko Etoh, Toyota; Tamotsu Ishigaki, Nagoya, and Kuniyuki Niwa, Kariya, all of Japan, assignors to Toyoda-Koki Kabushiki-Kaisha, Kariya, Japan**

**Filed Oct. 26, 1978, Ser. No. 954,740**
**Claims priority, application Japan, Oct. 28, 1977, 52-129985**
**Int. Cl.³ G06F *3/04***
**U.S. Cl. 364—200** **6 Claims**

1. A data transfer system comprising:

two operation processors each capable of outputting control data and address data to be transferred to the other of said two operation processors; and

a pair of data transfer devices associated respectively with said two operation processors and each including

addressable data memory means for storing said control data and said address data to be transferred between said two operation processors;

first signal generating means connected to an associated one of said operation processors for generating a first transfer control signal during the time when said associated one of said operation processors accesses said data memory means;

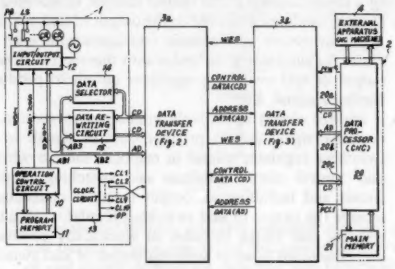
first access means connected between said data memory means and said associated one of said operation processors and operated in response to said first transfer control signal for transferring said control data therebetween;

an address counter for outputting address data to selectively designate memory addresses of said data memory means;

first and second data transmitters for transferring said control data and address data in serial fashion upon receiving the same in parallel fashion, respectively;

second signal generating means connected to said first signal generating means for periodically and selectively generating second and third transfer control signals during the time when said first signal generating means is not generating said first transfer control signal;

second access means connected between said address counter, said data memory means and said first and second data transmitters and operated in response to said second transfer control signal for applying said address data from said address counter to said data memory means and said second data transmitter and for applying to said first data transmitter said control data read out from said data memory means;



first and second data receivers connected to said first and second data transmitters provided in the other of said data transfer devices for receiving therefrom said control data and said address data in serial fashion so as to output the same in parallel fashion, respectively;

third access means connected to said first and second data receivers and said data memory means and operated in response to said third transfer control signal for storing said control data output from said first data receiver in one of said memory addresses of said data memory means designated by said address data output from said second data receiver; and

counter address advancing means connected to said first and second data receivers and also connected to said address counter provided in said other data transfer device for applying a signal to increment the content of said address counter provided in said other data transfer device connected thereto each time both of said first and second data receivers complete receipt of said control data and said address data.

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**4,298,929**

## INTEGRATED MULTILEVEL STORAGE HIERARCHY FOR A DATA PROCESSING SYSTEM WITH IMPROVED CHANNEL TO MEMORY WRITE CAPABILITY

**Anthony J. Capozzi, Binghamton, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jan. 26, 1979, Ser. No. 6,980**
**Int. Cl.³ G06F *13/00***
**U.S. Cl. 364—200** **1 Claim**

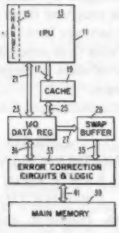
1. In a data processing system including a processing unit, at least one channel connected to said processing unit, a first high speed, low capacity memory cache, a second lower speed, high capacity main memory and an input/output register interconnecting said cache and said processing unit, wherein data is stored in said main memory in the form of full words, each full

word comprising a particular number of bytes and having an upper and lower boundary, and wherein data is stored in said cache in the form of cache pages each page comprising a plurality of full words, said channel providing input data for storage in said main memory, said input data being either in the form of full words whose boundaries correspond to boundaries of full words in said main memory or in the form of partial words which have less bytes than said particular number of bytes and the boundaries of which do not coincide with the boundaries of full words in main memory,

improved channel to memory write means for storing information in said main memory in response to a partial channel write request wherein the data supplied by said channel and loaded into said I-O register includes a partial word whose boundaries do not coincide with the boundaries of a full word in said main memory, comprising:

a swap buffer adapted to receive data from said input/output register and having at least one cache page storage capability;

an error correction circuit and logic subassembly connected between said input/output register and said main memory, said subassembly adapted to receive data from said swap buffer;




means responsive to a partial channel write request to determine if the data addressed by the channel write request is in said cache (a hit) or if the data addressed is not in said cache (a miss);

first means responsive to a hit to generate a full word by retrieving the addressed data from the cache and supplementing the partial word from said partial channel write request with the data from the cache in said I-O register a plurality of bytes at a time;

means responsive to said first means to transfer said full word generated by said first means to said main memory;

second means responsive to a miss to release said IPU to load said partial word from said I-O register into said swap buffer to retrieve the addressed data from said main memory and to combine the data from said partial channel write stored in said swap buffer with data from main memory; in said error correction circuits and logic subassembly, and

means responsive to said second means to store said combined full word to said main memory,

whereby said IPU is available for executing instructions unrelated to channel data transfers, while information to complete partial channel write requests is being retrieved and while said data is being transferred from said swap buffer to said memory.

**4,298,930**

## APPARATUS FOR DATA TRANSFER TO MICROPROCESSORS

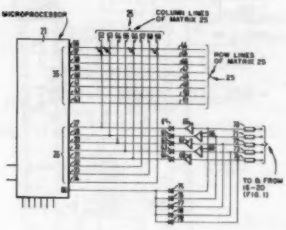
**Georg Haubner, Berg; Jürgen Wesemeyer, Nuremberg, and Hans Schrumpf, Oberasbach, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany**

**Filed Mar. 13, 1979, Ser. No. 20,225**

**Claims priority, application Fed. Rep. of Germany, Apr. 1, 1978, 2814124**

**Int. Cl.³ G06F *3/00***

**U.S. Cl. 364—200** **7 Claims**




1. An apparatus for transfer of data to and from a microprocessor (21), said microprocessor having

a first set of input-output terminals (26; 27–34) and a control terminal (80) to control input/output operations;

said apparatus comprising

a diode matrix (25) having a set of row lines and a set of column output lines (52–59) directly connected to said first set of microprocessor terminals (26; 27–34) for transferring primary data signals during a first time interval;

means (16–20) for generating supplementary signals representative of supplementary data

coupling means (70–74) connected to said supplementary signal generating means;

and signal switching means (60–64; 65–69) controlled by signals from said control terminal (80) of said microprocessor to apply, selectively, the primary data during the first time interval or the supplementary data during a second time interval to respective terminals of said first set comprising

a plurality of diodes (60–64) and a plurality of inverters (65–69) wherein respective input-output terminals (26; 27–34) are connected to the coupling means through the series connection of a respective one of said diodes and a respective one of said inverters;

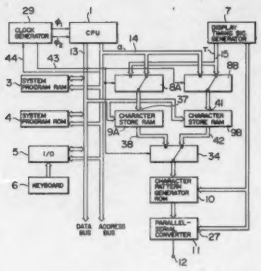
and coupling elements (75–79) coupling said control terminal (80) of the microprocessor (21) to the input of said inverters;

and wherein the relative polarities of the primary data signals, the output from the control terminal of said microprocessor, the polarity direction of the diodes (60–64) and the direction of inversion of the inverters are so poled that, when said control terminal (80) carries a first logic signal (e.g.:"0"), the inverter and the diode prevent passage of supplementary data therethrough and when said control terminal (80) carries a second logic signal (then: "1") the inverter is effective to unblock the diode and permit passage of supplementary data therethrough for application to the respective terminal of said first set of terminals so that, by change of polarity of the control signal, supplementary data are, selectively, blocked from application to the terminals of the first set during said first time interval and thereby to admit said primary data to said microprocessor and admitting signals representative of supplementary data during the second time interval, spurious paths for said signals representative of supplementary data blocked by the diodes in the diode matrix.

## 4,298,931
## CHARACTER PATTERN DISPLAY SYSTEM

**Tsuguji Tachiuchi; Shigeru Hirahata, and Teruhiro Takezawa, all of Yokohama, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Jun. 1, 1979, Ser. No. 44,379**
**Claims priority, application Japan, Jun. 2, 1978, 53-65685; Nov. 11, 1978, 53-139275; Dec. 18, 1978, 53-157824**
**Int. Cl.³ G06F *13/00***
**U.S. Cl. 364—200** **16 Claims**




**1**. A data processing system comprising:

(a) central processing circuit means including means for producing a plurality of different kinds of address signals;

(b) a plurality of random access memories (RAMs) for storing data, said RAMs being connected to said central processing circuit means to selectively receive data therefrom for storage in response to at least one of said kinds of address signals;

(c) memory switching means connected to said RAMs to sequentially switch said different kinds of address signals received from said central processing circuit means in alternate relation simultaneously to the respective RAMs to allow simultaneous accessing of the RAMs in response to the respective address signals; and

(d) output signal switching means for selectively applying to an output information output signals read out from said RAMs in response to at least one other of said kinds of address signals and in synchronism with the switching operation of said memory switching means, thereby permitting simultaneous execution of a plurality of different operations in association with said RAMs with simultaneous application of different kinds of address signals thereto.

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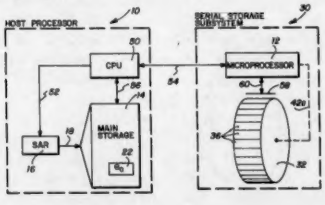
## 4,298,932
## SERIAL STORAGE SUBSYSTEM FOR A DATA PROCESSOR

**Jack G. Sams, Boynton Beach, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jun. 11, 1979, Ser. No. 47,005**
**Int. Cl.³ G06F *9/34, 15/16***
**U.S. Cl. 364—200** **22 Claims**




**1**. A data processing system comprising:

first processor means for generating instructions and push and pop operation codes;

first data storage means coupled to said first processor means and including a plurality of data storage locations for storing data;

second processor means coupled to said first processor means;

second data storage means coupled to said second processor means and including a plurality of data storage locations for storing data, each of said data storage locations of said second data storage means having a larger storage capacity than the storage capacity of each of said data storage locations of said first data storage means;

control means coupled to said first processor means and to said first data storage means to receive said instructions and codes generated by said first processor means for addressing one of said plurality of data storage locations of said first data storage means as an access window, such that data stored in said addressed one of said plurality of data storage locations of said first data storage means is provided to said first processor means for transfer to said second processor means to permit said second processor means to address said second data storage means, such that said first processor means thereby gains access to at least one of said plurality of data storage locations of said second data storage means by instructing said control means to address one of said plurality of data storage locations of said first data storage means; and

said second processor means operable in response to said instructions generated by said first processor means for transferring data received from said addressed one of said plurality of data storage locations of said first data storage means between said first processor means and at least one of said plurality of data storage locations of said second data storage means.

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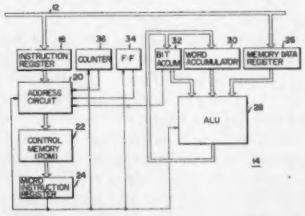
## 4,298,933
## DATA-PROCESSING DEVICE INCLUDING MEANS TO SUPPRESS THE EXECUTION OF UNNECESSARY INSTRUCTIONS

**Yoshiyuki Shimokawa, Hachioji, and Itaru Tanimoto, Fuchu, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan**

**Filed Jul. 3, 1979, Ser. No. 54,577**
**Claims priority, application Japan, Jul. 8, 1978, 53-83207; Jul. 8, 1978, 53-83209**
**Int. Cl.³ G06F *9/00***
**U.S. Cl. 364—200** **15 Claims**




**1**. A data processing device comprising:

memory means for storing data and machine instructions;

processing means for carrying out the logic operation on at least 1-bit of data and the arithmetic operation on data formed of a plurality of bits, and, where a predetermined condition is established, suppressing the execution of one or more of the following instruction;

a bit accumulator connected to said processing means for holding the result of the logic operation on at least 1-bit of data, the contents of the bit accumulator being used as the predetermined condition; and

means for carrying out the transmission of data between external equipment and the memory means or processing means.

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**4,298,934**

## PROGRAMMABLE MEMORY PROTECTION LOGIC FOR MICROPROCESSOR SYSTEMS

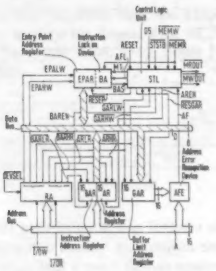
**Rudolf Fischer, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany**

**Filed Aug. 10, 1979, Ser. No. 65,649**

**Claims priority, application Fed. Rep. of Germany, Sep. 29, 1978, 2842548**

**Int. Cl.³ G06F *13/00***

**U.S. Cl. 364—200** **4 Claims**



1. A programmable memory protection system for a microprocessor system comprising in combination;

a buffer limit address register adapted to receive and store at least one buffer limit address identifying a memory area to be protected,

an address error recognition device connected to said buffer limit address register and to an address bus of said microprocessor system and responsive thereto for producing an address error signal when the address on said address bus is within the protected memory area,

said address error recognition device comprising a decoder having its inputs connected to a group of the highest order bit lines of the address bus,

said buffer limit address register storing a plurality of binary bits corresponding to a specific memory block, said bits identifying whether or not such block is protected,

a plurality of gates individually connected with said decoder and with said buffer limit address register for comparing the bits stored in said buffer limit address register with the information on said address bus,

circuit means interconnected with said gates for producing an address error signal in response to operation of said gates,

and a control logic unit connected to said address error recognition device and responsive to said address error signal for suppressing a memory write signal.

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**4,298,935**

## INTERFACE CIRCUIT FOR COUPLING AN AUTOMATED MAINTENANCE SYSTEM TO A CPU

**Ronald E. Lange, Phoenix, and Robert J. Koegel, Glendale, both of Ariz., assignors to Honeywell Information Systems Inc., Phoenix, Ariz.**

**Filed Oct. 5, 1979, Ser. No. 82,435**

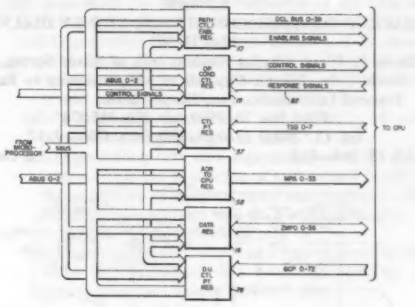
**Int. Cl.³ G06F *7/00, 11/14***

**U.S. Cl. 364—200** **2 Claims**

1. An interface apparatus for coupling an automated maintenance system (AMS) to the CPU of a data processing system comprising:

a first means for converting information from said automated maintenance system into predetermined control signals, said predetermined control signals for controlling the pathways in said CPU accessed by said AMS, said predetermined control signals also for controlling the operations performed by said CPU;

a second means for receiving control point information signals from said CPU, said control point information signals indicating the internal status thereof said second means further including means for transferring said point information signals to said automated maintenance system;



a third means for supplying AMS supplied address information to said CPU for use by it in selected operations;

a fourth means for transferring AMS supplied data to said CPU, said fourth means including apparatus for receiving and holding data from said CPU requested by said AMS by said supplied data; and

a bus means coupling said AMS to said first, second, third and fourth means for supplying the proper information to each said means for performing its operations and for supplying information from said fourth means to said AMS.

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**4,298,936**

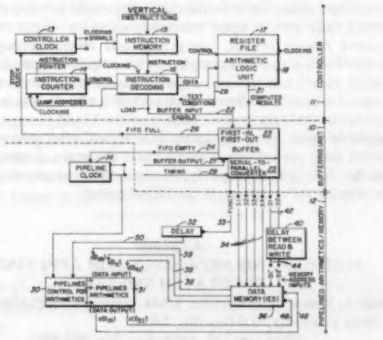
## ARRAY PROCESSOR

**Gerald N. Shapiro, Newton, Mass., assignor to Analogic Corporation, Wakefield, Mass.**

**Filed Nov. 15, 1979, Ser. No. 94,428**

**Int. Cl.³ G06F *9/38***

**U.S. Cl. 364—200** **11 Claims**



1. An Array Processor comprising in combination:

a controller having serially generated words as an output therefrom;

a buffering unit including a FIFO buffer and a serial-to-parallel converter coupled thereto:

means for coupling said serially generated words to said buffering unit; and,

a pipelined arithmetic unit and memory coupled to said buffering unit and controlled thereby.

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**4,298,937**
**Patent Not Issued For This Number**

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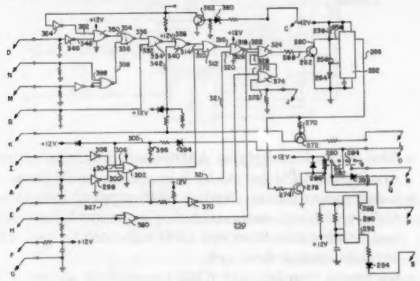
**4,298,938**
**BACKUP CONTROL CIRCUIT FOR KIDNEY DIALYSIS MACHINE**

**Cheng L. Wang; Charles Soodak, both of Silver Spring, and David Lohr, Ellicott City, all of Md., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.**

**Filed Jan. 28, 1980, Ser. No. 115,874**
**Int. Cl.[3] B01D** *13/00;* **G05D** *7/06;* **G06G** *7/57*
**U.S. Cl. 364—413** **3 Claims**



1. A backup control circuit for use with a main control circuit for a kidney dialysis machine, said backup control circuit being operable upon failure of the main control circuit to operate within a predetermined time period to cause closing of a dialysate operate valve and opening of a dialysate bypass valve or stopping of a blood pump when an aberrant condition in the dialysate conductivity, temperature, flow or negative pressure is sensed or when an aberrant condition in the arterial or venous blood pressure is sensed or excessive leakage of blood into the dialysate is sensed and said backup control circuit including control circuit means for controlling operation of said backup control circuit and having input contacts coupled to sensor inputs to the main control circuit, time delay circuit means having an input coupled to said control circuit means and operable to initiate a timing cycle for said predetermined time period upon receiving an error signal from said control circuit means, energizing and de-energizing circuit means having an input coupled to an output of said time delay circuit means and having outputs coupled to points in the main control circuit associated with coils for the dialysate operate valve, the dialysate bypass valve and the blood pump relay and operable upon receiving an operate signal, after said predetermined time period has occurred and the main control circuit has not functioned properly, to close the operate valve, open the bypass valve and stop the blood pump.

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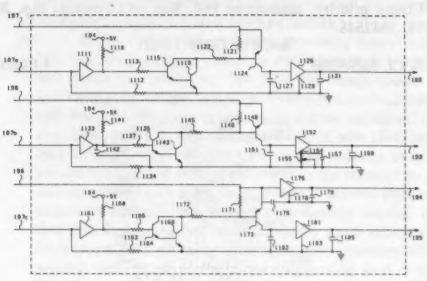
**4,298,939**
**METHOD AND APPARATUS FOR APPLYING A REGULATED VOLTAGE**

**Dale A. Fluegel, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.**

**Filed Oct. 30, 1978, Ser. No. 955,732**
**Int. Cl.[3] G05F** *1/56;* **H03K** *3/26;* **G01V** *1/28*
**U.S. Cl. 364—421** **22 Claims**

3. Apparatus comprising:
a computer means;
a transistor switch;
a voltage regulator means having an input and an output, said voltage regulator means providing a regulated voltage at said output in response to an electrical current being supplied to said voltage regulator means;
means for supplying a binary signal from said computer means to said transistor switch; and
means for supplying an electrical current flow to said voltage regulator means only when said transistor switch is turned on by the binary signal from said computer means.

11. A method for supplying a regulated voltage to a computer controlled remote geophone monitoring means which is being used to acquire seismic data, a central control means



being utilized to control and acquire data from a plurality of remote geophone monitoring means, comprising the steps of:
actuating a transistor switch from a first state to a second state in response to a binary signal from the computer controlling said remote geophone monitoring means;
enabling an electrical current to be supplied to a voltage regulator means during the occurrence of said second state; and
providing a regulated voltage from said voltage regulator means in response to said electrical current being supplied to said voltage regulator means.

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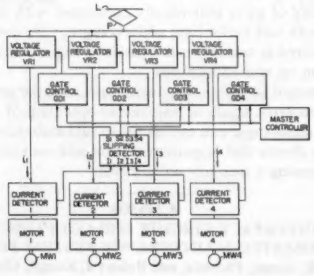
**4,298,940**
**SLIPPING DETECTOR SYSTEM FOR VEHICLES**

**Tomio Tadokoro, Katsuta, and Tatsuro Horie, Mito, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Jun. 7, 1979, Ser. No. 46,330**
**Claims priority, application Japan, Jun. 10, 1978, 53-69386**
**Int. Cl.[3] G06F** *15/20;* **H02P** *5/50*
**U.S. Cl. 364—426** **19 Claims**




1. A slipping detection system for vehicles having wheels driven by motors, comprising
means for detecting at least one electric value which changes in relation to the rotational speed of at least one of the wheels;
means for detecting the change in said electric value; and
means for detecting the slipping of said one wheel when the change in said electric value associated with said wheel is larger than a predetermined value, including means for

receiving the output of said electric value detector means in a time division manner, memory means for storing a currently-received electric value until a subsequent electric value is received, means for comparing said subsequently-received electric value with said current electric value received previously as stored in said memory means, and means for detecting a slipping of said wheel when the difference between said subsequent electric value and said previously-received stored electric value exceeds a predetermined value.

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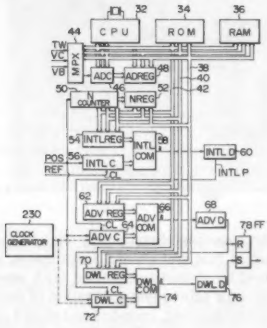
**4,298,941**

## METHOD FOR CONTROLLING AN INTERNAL COMBUSTION ENGINE

**Toshio Furuhashi, Mito, Japan, assignor to Hitachi, Ltd., Tokyo, Japan**

**Filed Feb. 14, 1980, Ser. No. 121,476**
**Claims priority, application Japan, Feb. 19, 1979, 54-17329**
**Int. Cl.³ F02P** *5/08, 3/02;* **F02B** *5/02*
**U.S. Cl. 364—431** **20 Claims**




1. A method of operating a processor-controlled apparatus for controlling the operation of a combustion engine, said engine including an output shaft driven by mechanical energy converted from heat energy caused by the combustion of fuel, said engine including a source of electrical energy, ignition means, coupled with said source, for cyclically storing energy supplied from said source and discharging energy to be employed for combustion of fuel, detecting means, coupled to said engine output shaft, for producing a reference signal in response to a predetermined angle of rotation of the engine output shaft, and sensor means for producing signals representative of operational conditions of the engine,

said method comprising, for each cycle of operation of said ignition means, the steps of:

(a) generating a first signal in response to which said ignition means begins the storage of energy from said source and causing said ignition means to store energy for a prescribed charging duration, and

(b) generating a second signal in response to which said ignition means discharges energy stored thereby so as to cause the combustion of fuel in said engine, the time interval from the generation of said second signal to the generation of said first signal corresponding to a predetermined period of time that energy is not being stored by said ignition means,

and wherein step (b) comprises the step of:

(b1) in response to a reference signal from said detecting means, generating first data, the value of which is successively changed from a first prescribed value until the value of said first data corresponds to a value representative of the time at which said second signal is to be generated, and thereupon causing the generation of said second signal, and

wherein step (a) comprises the step of

(a1) in response to the value of said first data corresponding to the value representative of the time at which said second signal is to be generated in step (b), generating second data the value of which is successively changed until the value of said second data corresponds to a value representative of the time at which said first signal is to be generated, and thereupon causing the generation of said first signal,

and wherein, for successive cycles of storage and discharge of energy by said ignition means, step (a) further comprises the step of

(a2) generating the value representative of the time at which said first signal is to be generated by:

(a2-1) generating third data representative of the interval between the time of occurrence of said second signal for a present cycle and the time of occurrence of said second signal for the previous cycle,

(a2-2) generating fourth data representative of said prescribed charging duration, and

(a2-3) generating fifth data representative of the time interval from the generation of said second signal to the generation of said first signal in accordance with the difference between said third and fourth data,

and wherein step (a1) comprises the step of

(a1-1) generating said first signal in response to the value of said second data becoming equal to or greater than the value of said fifth data.

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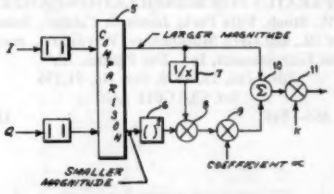
**4,298,942**

## NONLINEAR AMPLITUDE DETECTOR

**Henry E. Lee, Columbia, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.**

**Filed Dec. 19, 1979, Ser. No. 105,363**
**Int. Cl.³ G06F** *15/20, 7/552*
**U.S. Cl. 364—483** **8 Claims**




1. A nonlinear amplitude detector comprising

comparator means receiving the inphase and quadrature components of a signal and determining the relative magnitude thereof,

signal component squaring means squaring the smaller magnitude signal component,

means for dividing the squared smaller magnitude signal component by the larger magnitude signal component,

first multiplier means multiplying the quotient thereof by a coefficient $\alpha$, and

means for summing the output of said multiplier means with the larger magnitude signal component.

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**4,298,943**

## HEATING SYSTEM

**Clement R. Tompson, 3020 LaPorte, Melrose Park, Ill. 60164, and Garrett Gruner, 1610 W. Kalamazoo, Lansing, Mich. 48915**

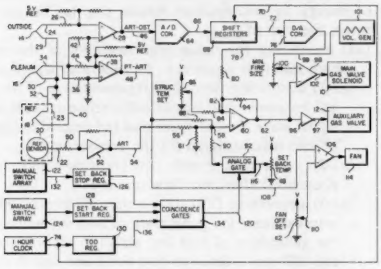
**Filed Jun. 7, 1979, Ser. No. 46,227**
**Int. Cl.³ G06F** *15/20;* **G05D** *23/19*
**U.S. Cl. 364—505** **28 Claims**

1. A method of controlling the energy released by a furnace for efficiently heating a structure to a desired temperature comprising:

measuring a temperature outside the structure;

delaying the measured outside temperature for a predetermined interval; and

automatically adjusting the rate of a continuous flow of fuel to the furnace as a function of the difference between the desired temperature of the structure and the delayed, previously measured value of the outside temperature;



whereby the structure temperature achieved is substantially equal to the desired structure temperature, the furnace operates substantially continuously at a reduced energy input, and the energy input to the furnace and the energy output from the furnace vary in response to changes in the outside temperature.

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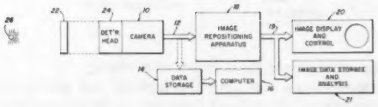
**4,298,944**

## DISTORTION CORRECTION METHOD AND APPARATUS FOR SCINTILLATION CAMERAS

**Everett W. Stoub, Villa Park; James G. Colsher, Schaumburg, both of Ill., and Gerd Muehllehner, Wayne, Pa., assignors to Siemens Gammasonics, Inc., Des Plaines, Ill.**

**Filed Jun. 22, 1979, Ser. No. 51,176**
**Int. Cl.³ G01T *1/20***
**U.S. Cl. 364—515** **11 Claims**



1. A spatial distortion correction method for use in correcting the inherent distortion characteristics of radiation imaging apparatus, the radiation imaging apparatus including data output signals representing image event coordinates, the spatial distortion correction method comprising the steps of:

calculating spatial distortion correction factors at a predetermined number of image event points from orthogonal line pattern test data obtained in an initial off-line test phase;

modifying said spatial distortion correction factors calculated in said calculating step in accordance with image field test data obtained in an off-line test phase, said image field test data including image event data obtained from a uniform image irradiation of said radiation imaging apparatus;

storing said modified spatial distortion correction factors for use in correcting the image event data output signals from said radiation imaging apparatus; and

correcting the image event data output signals from said radiation imaging apparatus during on-line operation in accordance with said modified spatial distortion correction factors.

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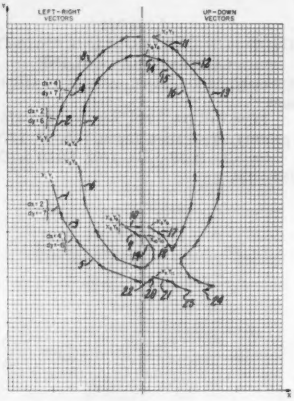
**4,298,945**

## CHARACTER GENERATING METHOD AND APPARATUS

**Derek J. Kyte, Brookthorpe, England; Walter I. Hansen, Cold Spring Harbor, N.Y., and Roderick I. Craig, Cheltenham, England, assignors to Eltra Corporation, Toledo, Ohio**
**Division of Ser. No. 905,451, May 12, 1978. This application May 3, 1979, Ser. No. 35,488**

**Int. Cl.³ G06F *3/14***
**U.S. Cl. 364—523** **34 Claims**



1. A method for encoding characters in relation to a normalized encoding set of first and second coordinates, wherein a character is defined by at least one outline, with storing of the encoded characters for subsequent generation of desired characters from the corresponding, encoded and stored characters, comprising:

(a) storing digital numbers defining the first and second coordinates of the start point of a character outline; and

(b) storing digital numbers representing a plurality of straight line vectors extending successively along the character outline from said start point, each vector being represented by a first digital number defining the first coordinate distance and a second digital number defining the second coordinate distance from one end of the vector to the other.

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**4,298,946**

## ELECTRONICALLY CONTROLLED PROGRAMMABLE DIGITAL THERMOSTAT

**Glenn A. Hartseli, Dallas, and F. Thomas Bilek, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Dec. 18, 1978, Ser. No. 970,019**
**Int. Cl.³ G05D *23/32***
**U.S. Cl. 364—557** **26 Claims**

1. An electronic digital thermostat system for controlling heating and cooling systems supplying an indoor area to maintain desired ambient temperatures during selected time periods in said area, said thermostat system comprising:

(a) temperature sensing means including at least one temperature sensor for sensing the ambient temperature of said area and for providing a digital signal indicative thereof;

(b) oscillator means for generating time pulses;

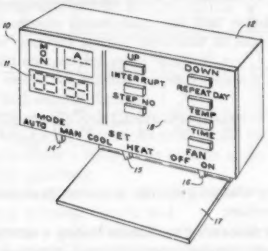
(c) digital processor means having a plurality of input and output terminals, said digital processor means being coupled to said oscillator means and said temperature sensing means for receiving said time pulses and for continually monitoring said ambient temperature, said digital processor means including a memory for storing digital coded information entered therein while said information is

being processed, said digital processor means being responsive to real time and ambient temperature and to said digital coded information for controlling the heating and cooling systems in accordance with a permanently stored instruction sequence to maintain said desired ambient temperature;

(d) data entry means coupled to said digital processor means for entering said digital coded information into said digital processor means, said data entry means including:

(i) means for selecting certain ones of a plurality of operating modes of the thermostat system; and

(ii) keyboard means having a plurality of keys for entering digital coded time and temperature information into said digital processor means, said data entry means being selectively coupled between a plurality of said input and output terminals of said digital processor




means, said digital processor means including means for selectively applying electrical signals to said keys via said output terminals and for receiving encoded electrical signals from said keys via said input terminals in response to said selectively applied electrical signals;

(e) digital display means for displaying desired parameters of time and temperature including information entered from said keyboard means, said display means being coupled to selected ones of said output terminals of said digital processor means;

(f) electrically controllable switch means coupled to at least one of said output terminals for selectively activating and deactivating said heating and cooling systems in accordance with signals from said digital processor means; and

(g) connector means for connecting said thermostat system to the heating and cooling systems and to a power supply.

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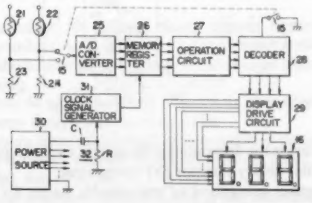
**4,298,947**

## INTRABOX TEMPERATURE DISPLAY DEVICE

**Hiroshi Tamura, Yokohama, and Yutaka Nakaie, Kawasaki, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan**

**Filed Nov. 15, 1979, Ser. No. 94,567**
**Claims priority, application Japan, Nov. 15, 1978, 53-140837**
**Int. Cl.³ G01K *7/14***
**U.S. Cl. 364—557** **3 Claims**




1. An intrabox temperature display device comprising:

a temperature sensor disposed within an intrabox for sensing a temperature of an air within the intrabox;

an A/D converter for converting a signal representing the intrabox temperature detected by said temperature sensor into a digital signal;

memory means comprised of n latch circuits and connected to receive clock signals from a clock signal generator in a given timing to sequentially latch n samples and store a succession of n samples each including n bits which are A/D converted by said A/D converter;

an operation circuit for averaging the detected data with a succession of samples read out of said memory means to produce averaged temperature digital data;

decoder means connected to said operation circuit to read out the temperature data stored at a memory location by an address signal of the averaged temperature digital data; and

display means for displaying the temperature data read out of said decoder means as a temperature approximate to a temperature of a food in the intrabox.

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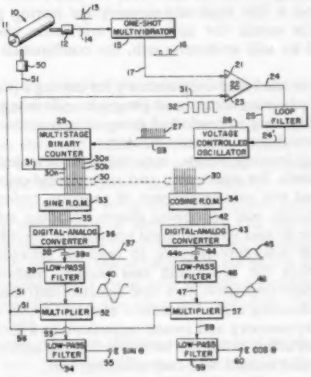
**4,298,948**

## METHOD AND APPARATUS FOR GENERATING A DIGITAL REPRESENTATION OF THE INSTANTANEOUS ANGULAR POSITION OF A ROTATING BODY AND FOR GENERATING RECTANGULAR COORDINATE EQUIVALENTS THEREOF

**Dean T. Davis, Columbus, Ohio, assignor to IRD Mechanalysis, Inc., Worthington, Ohio**

**Filed Nov. 30, 1979, Ser. No. 98,729**
**Int. Cl.³ G06J *1/00*; G01M *1/22***
**U.S. Cl. 364—603** **14 Claims**




1. A method for generating a sinusoidal electrical reference signal corresponding to the instantaneous angular position of a rotating body which comprises:

generating one or more uniformly spaced electrical original pulses for each rotation of the said rotating body;

generating an electrical pulsed signal having $2^n$ uniformly spaced pulses between each of said original pulses;

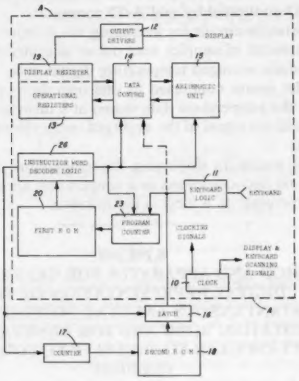
counting the pulses of said uniformly spaced pulses in a binary code signal counter which uniquely represents $2^n$ angular positions of the said rotating body; then converting the said binary code signal in a sine function read only memory device to a digital representation of a sine function which corresponds to the instantaneous angular position of the said rotating body; and

then filtering the digital representation of the sine function to a corresponding analog representation of the same sine function which is synchronized with the instantaneous angular position of the said rotating body.

## 4,298,949
## ELECTRONIC CALCULATOR SYSTEM HAVING HIGH ORDER MATH CAPABILITY

**Sydney W. Poland, Arlington, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Aug. 16, 1976, Ser. No. 714,464**
**Int. Cl.[3] G06F *9/30, 15/02***
**U.S. Cl. 364—706** **6 Claims**



1. In an electronic microprocessor system, having input means for receiving data and for receiving input commands, output means for outputting data, a memory means for storing data received and data to be outputted, an arithmetic unit for performing arithmetic operations on data stored in said memory, and a first read-only-memory for storing groups of instruction words for controlling arithmetic operations performed by said arithmetic unit, the combination which comprises:

(a) a second read-only-memory for storing a plurality of sets of program codes, each program code being effective for addressing a preselected group of instruction words stored in said first read-only memory;

(b) addressing means, responsive to selected input commands, for addressing said second read-only-memory to read out preselected sets of program codes in response thereto, said addressing means including means, responsive to said selected input commands, for addressing said first read-only-memory to read-out selected instruction words for addressing said second read-only-memory, means responsive to a first selected instruction word for addressing a predetermined address in said second read-only-memory and means responsive to a second selected instruction word for incrementing the address addressed in said second read-only-memory; and

(c) means for addressing said first read-only-memory in response to the program codes read out of said second read-only-memory.

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## 4,298,950
## MULTIPOINT PIPELINE PROCESSOR FOR COMPUTING THE DISCRETE FOURIER TRANSFORM

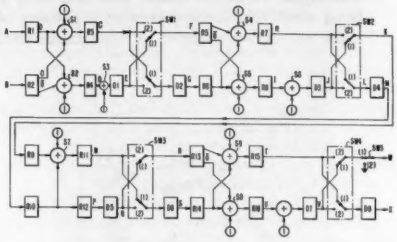
**Winthrop W. Smith, Jr., Maitland, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.**

**Filed Oct. 12, 1979, Ser. No. 84,221**
**Int. Cl.[3] G06F *15/332***
**U.S. Cl. 364—726** **48 Claims**

1. A pipeline processor for performing a discrete Fourier transformation (DFT) on an input array of N signal values to derive an output array of at most N signal values representative of the frequency transformation of said input array, said processor comprising:

an input processing section including a first plurality of cascadedly coupled computational elements, each operative individually to perform only additions and subtractions substantially in a butterfly-type arrangement, said input processing section including means for operating on said input array of N signal values with said first plurality of computational elements in a pipeline computational fashion and for propagating the resulting interelement computed signal values therethrough in a first predetermined signal flow pattern to render a first intermediate array of signal values;

an intermediate processing section for multiplying each signal value of said first intermediate array with at least one respectively corresponding predetermined transformation value to generate a second intermediate array of signal values;



an output processing section including a second plurality of cascadedly coupled computational elements, each operative individually to perform only additions and subtractions substantially in a butterfly-type arrangement, said output processing section including means for operating on said second intermediate array of signal values with said second plurality of computational elements in a pipeline computational fashion and for propagating the resulting interelement computed signal values therethrough in a second predetermined signal flow pattern to render said output array of at most N signal values.

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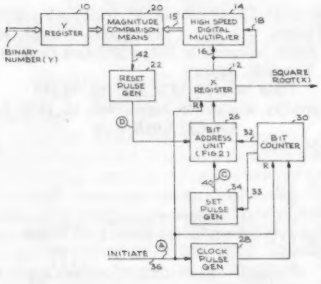
## 4,298,951
## NTH ROOT PROCESSING APPARATUS

**Stanley R. Hall, Westlake Village, Calif., assignor to Bunker Ramo Corporation, Oak Brook, Ill.**

**Filed Nov. 30, 1979, Ser. No. 99,201**
**Int. Cl.[3] G06F *7/552***
**U.S. Cl. 364—752** **7 Claims**



1. A processor for determining the square root of a predetermined multibit binary number (Y) comprising:

a first register comprised of multiple bit stages for storing said binary number (Y);

a second register comprised of multiple bit stages including

a most significant bit stage and stages of successively lesser significance including a least significant bit stage;

a high speed digital multiplier having multiplier input terminals, multiplicand input terminals and product output terminals and including means responsive to the application of signals representative of first and second binary numbers to said multiplier and multiplicand input terminals respectively for producing binary signals representative of the product of said first and second binary numbers on said product output terminals;

means connecting said second register to both the multiplier and multiplicand input terminals of said multiplier;

magnitude comparison means having first and second input terminals and an output terminal, and including means for developing a first output signal on said output terminal if a number applied to said first input terminal exceeds a number applied to said second input terminal and a second output signal on said output terminal if a number applied to said second input terminal exceeds a number applied to said first input terminal;

means respectively connecting said first register and said multiplier product output terminals to said comparison means first and second input terminal;

initializing means for initially writing a binary zero to each stage of said second register;

addressing means for addressing said stages of said second register sequentially from said most to said least significant bit stage to write a binary one in each stage;

a clock pulse generator;

a bit counter responsive to said clock pulse generator for generating indexing signals; and

means responsive to said indexing signals and said first output signal on said comparison means output terminal for incrementing said addressing means to address a succeeding stage and responsive to said second output signal on said magnitude comparison means output terminal for writing a binary zero into the addressed stage of said second register prior to addressing a succeeding stage.

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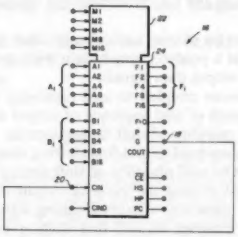
**4,298,952**

## ONE'S COMPLEMENT ADDER

**Russell W. Guenthner, Glendale; Joseph C. Circello, and Anthony J. Galcik, both of Phoenix, all of Ariz., assignors to Honeywell Information Systems Inc., Phoenix, Ariz.**

**Filed Dec. 10, 1979, Ser. No. 102,300**
**Int. Cl.³ G06F 7/50**
**U.S. Cl. 364—786** **5 Claims**



1. An adder for adding binary signals representing two binary numbers $A_i$, $B_i$ in the one's complement notation each of the numbers having i bits, where i is an integer other than zero, comprising:

two sets of input terminals adapted to have applied to them binary signals representing $A_i$ $B_i$;

a carry-in terminal adapted to have a binary signal representing a binary number to be summed with the two lowest order bits of $A_i$ $B_i$;

i output resultant terminals, said adder including means for producing binary resultant signals $F_i$ representing the sum of $A_i$, $B_i$, and the signal applied to the carry-in terminal at the i output resultant terminals;

a generate output signal terminal, said adder including means for producing a binary signal representing a binary carry generate number G, the value of which is independent of any signal applied to the carry-in terminal, and for applying the carry generate signal G to the generate output terminal; and

circuit means for applying the carry generate signal G to the carry-in terminal of the adder.

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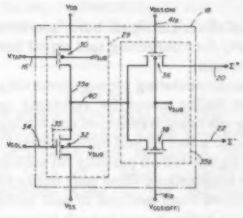
**4,298,953**

## PROGRAMMABLE ZERO-BIAS FLOATING GATE TAPPING METHOD AND APPARATUS

**Scott C. Munroe, Acton, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.**

**Filed Feb. 28, 1979, Ser. No. 16,334**
**Int. Cl.³ G06G 7/19; H03K 5/195**
**U.S. Cl. 364—825** **17 Claims**



1. A method for selectively summing the time-varying components of a plurality of electrical potentials for obtaining a selectively weighted average of said time-varying signal components, each electrical potential able to be characterized by the sum of a bias component and a said time-varying signal component, said method comprising the steps of

selectively connecting using electrical control signals said electrical potentials to at most one of a first and a second summing bus through respective selected impedances,

for each bus, allowing the voltage level thereon to float at a voltage substantially equal to a weighted average of the bias components of the electrical potentials connected thereto, and

measuring the potential difference across said buses,

whereby said potential difference characterizes the selectively weighted average of said time-varying components.

8. An apparatus for selectively summing the time-varying signal components of each of a plurality of electrical potentials for obtaining a selectively weighted average of said time-varying signal components, each potential being characterized by the sum of a bias component and a said time-varying signal component, said apparatus comprising

first means for selectively connecting each said electrical potential through a respective impedance to at most one of a first and a second summing bus, the voltage level on each bus being allowed to float at a voltage substantially equal to a weighted average of the bias components of the electrical potentials connected thereto, and

second means for measuring a potential difference across said buses,

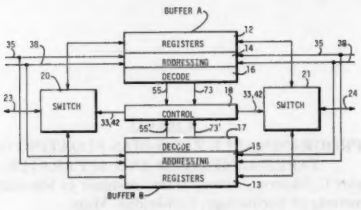
whereby said measured potential difference characterizes the selectively weighted average of said time-varying signal components.

## 4,298,954

## ALTERNATING DATA BUFFERS WHEN ONE BUFFER IS EMPTY AND ANOTHER BUFFER IS VARIABLY FULL OF DATA

George A. Bigelow, Boulder; Ted A. Rehage, and Frankie S. Shook, both of Longmont, all of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1979, Ser. No. 34,234
Int. Cl.[3] G06F *3/00*
U.S. Cl. 364—900 21 Claims




1. In a data path concentrator for connecting a high speed unit to a plurality of signal burst units for transferring signals in bursts of such signals therebetween, the improvement comprising:

a plurality of electrical signal burst accommodating means respectively for connecting said signal burst units to said high speed unit;

each said accommodating means comprising a plurality of switchable buffer means for receiving and temporarily storing signals being transferred and having control means responsive to a one of said buffer means therein which is receiving signals which partially fill such receiving means to a given intermediate filled state buffer to switch signals being received from said one of said buffer means to another of said buffer means in such accommodation means whenever said another buffer means is empty and

means responsive to the predetermined data activities of all of said units for selectively activating said accommodating means to buffer bursts of signals, whereby all said signal burst accommodating means may simultaneously receive signals for transfer between said high speed unit and respective ones of said signal burst means at maximal data transfer rates.

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## 4,298,955

## METHOD OF AND APPARATUS FOR THE DETECTION AND ANALYSIS OF HAZARDS

George Munday, London; David H. Slater, Berkshire; Leonard R. T. Tyley; Brian J. Berenblut, both of London, and Harry B. Whitehouse, Sevenoaks, all of England, assignors to The Insurance Technical Bureau, London, England

Filed Mar. 23, 1977, Ser. No. 780,307
Claims priority, application United Kingdom, Apr. 1, 1976, 13296/76; Aug. 25, 1976, 35329/76
Int. Cl.[3] G06F *11/34, 15/46*
U.S. Cl. 364—900 19 Claims

1. A system for monitoring conditions of a plant in which chemical materials are operated upon, based upon a combination of signals representative of at least two sensed parameters within the operation, the parameters being selected from the group consisting of state variables, process variables and equipment variables, the plant comprising vessels, flow control means directing flow of materials between vessels, and material reservoirs, the monitoring system comprising:

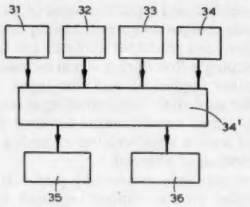
(i) a plurality of transducers positioned within the plant to simultaneously detect the value of a plurality of operating parameters and to generate signals representative of said values;

(ii) a programmed processing device connected to receive a plurality of said signals, said processing device having:

(a) first means for producing selected combinations of said plurality of signals,

(b) second means for comparing each said combination of signals with a respective normal combination signal to produce a deviation signal if said compared signal deviates from said normal combination signal,

(c) the program comprising a decision table having columns each of which represents a combination of parameter values produced during operation of the process in




a selected order to assign a predetermined value to a deviation signal in accordance with the location of the corresponding value of the combination signal in the decision table; whereby monitoring of the conditions of a plant is obtained by the relationship between a signal representing a combination of sensed parameters and the corresponding signal in said decision table; and

(iii) receiving means comprising recording means to record the deviation signals of combinations of selected ones of said plurality of signals.

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## 4,298,956

## DIGITAL READ RECOVERY WITH VARIABLE FREQUENCY COMPENSATION USING READ ONLY MEMORIES

Donald J. Rathbun, Andover, and David B. O'Keefe, Westford, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed May 14, 1979, Ser. No. 38,977
Int. Cl.[3] G06F *7/22;* G11B *5/09*
U.S. Cl. 364—900 7 Claims

1. A data memory system including apparatus for compensating for the varying frequency of clock signals and data signals in an information stream received from a device in a plurality of modes and for converting into decoded data signals comprising:

receiving means for storing each of said clock signals and said data signals at a predetermined logic level and generating a sequence of output data signals;

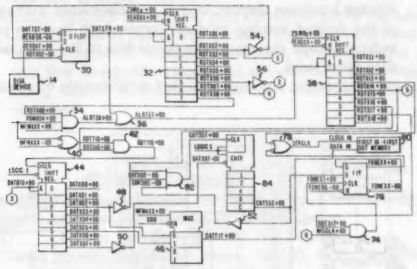
first shifting means coupled to said receiving means and responsive to each of said sequence of output data signals for generating a plurality of shift timing signals;

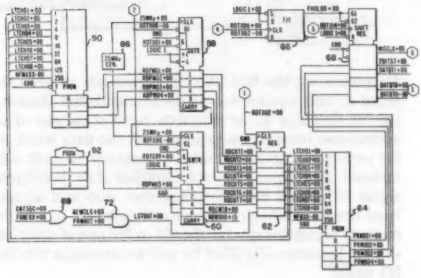
counting means coupled to said first shifting means and responsive to a first of said plurality of shift timing signals generated by a first of said sequence of output data signals for generating a sequence of interval timing signals;

register means coupled to said first shifting means and said counting means and responsive to a second of said plurality of shifting timing signals generated by a second of said sequence of output data signals and said sequence of interval timing signals for generating a plurality of latch signals indicative of the interval of time between said first and said second of said sequence of output data signals; and

read only memory means coupled to said register means and responsive to said latch signals for generating initialization signals representative of a variance of time between said first and said second of said sequence of output data signals and for generating a plurality of predetermined numbers indicative of an expected time between said first and said second of said sequence of output data signals;

said counting means being further coupled to said read only memory means and responsive to a third shift timing signal and said initialization signals for presetting said counting





means for compensating for the difference between an expected time and an actual time between said each of said sequence of output data signals.

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**4,298,957**

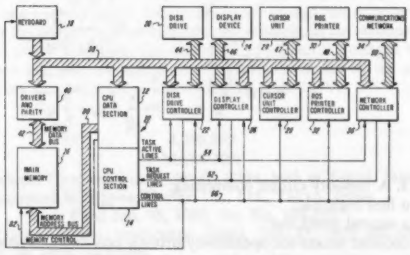
## DATA PROCESSING SYSTEM WITH CHARACTER SORT APPARATUS

**William S. Duvall, Portola Valley, Calif., and William K. English, Tokyo, Japan, assignors to Xerox Corporation, Stamford, Conn.**

**Filed Jun. 28, 1979, Ser. No. 52,993**

**Int. Cl.³ G06F** *3/153, 3/12*

**U.S. Cl. 364—900** **14 Claims**



**1**. A data processing system comprising:

first storage means for storing character font data representative of a plurality of characters, each character being represented by said font data as a bit map of predetermined dimensions, said plurality of characters being stored in an ordered storage sequence;

image presentation means for visually presenting an image comprised of preselected ones of said characters on a predetermined background area;

second storage means for storing a bit map representation of said image;

visual control means for controlling said image presentation means to visually present said image in accordance with the character font data stored in said bit map representation of said image in said second storage means;

third storage means for storing a list of identification data for at least some of said preselected characters to be visually presented, said identification data identifying the type and style of each character as well as its desired location on said background area; and

data control means for controlling the processing and handling of character font data, said data control means comprising sorting means for sorting the identification data in said third storage means into said ordered storage sequence, accessing means responsive to said sorted identification data for accessing from said first storage means in said ordered storage sequence the character font data for each character identified in said list, and loading means for loading the character font data for each accessed character into said bit map representation in said second storage means at a location defined by the identification data for that character.

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**4,298,958**

## SEQUENCE CONTROL SYSTEM

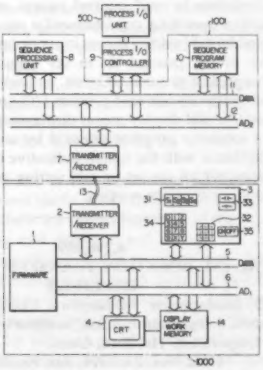
**Masaoki Takaki; Hirokazu Sawano; Kunio Yamanaka; Kazuyoshi Asada, all of Hitachi; Keiji Hideshima, Fujisawa, and Haruo Koyanagi, Ome, all of Japan, assignors to Hitachi, Ltd., Tokyo and Nissan Motor Co., Ltd., Yokohama, both of, Japan**

**Filed Sep. 7, 1979, Ser. No. 73,370**

**Claims priority, application Japan, Sep. 13, 1978, 53-111662; Sep. 13, 1978, 53-111663**

**Int. Cl.³ G05B** *11/00;* **G06F** *9/06, 11/00*

**U.S. Cl. 364—900** **3 Claims**



**1**. A sequence controller for effecting sequence control of a process to be controlled by sequentially accessing and reading a selected one of a plurality of sequence programs, said sequence controller comprising:

a sequence program memory for storing a plurality of sequence programs;

a process I/O unit including a scanner and switching means, said scanner including means for sequentially inputting signals indicative of conditions of the process to be controlled through said switching means and for sequentially

applying control signals to the process to be controlled through said switching means;

a buffer memory including an input memory portion for storing the signals indicative of the conditions of the process which are sequentially inputted from the process to be controlled through said process I/O unit, and an output memory portion for storing the control signals for the process which are sequentially obtained in accordance with a sequence program read out of said sequence program memory;

means for selectively connecting said buffer memory to said switching means in said process I/O unit for transmitting the signals indicative of the conditions of the process and the control signals for the process therebetween;

a sequence processing unit connected to said sequence program memory and said buffer memory for processing a sequence program selectively read out of said sequence program memory on the basis of data stored in said input memory portion of said buffer memory and applying results of the processing operation to said output memory portion as the control signals for the process;

setting means for manually selecting a sequence program in accordance with a sequence logic of the process to be controlled and for manually setting conditions of the process to be controlled, said setting means including means for outputting a first signal indicative of a selected sequence program and a second signal indicative of set conditions of the process;

control means connected to said setting means and coupled to said sequence program memory for selectively reading a corresponding sequence program from said sequence program memory in accordance with said first signal and for applying the selected sequence program to said sequence processing unit, and having means for setting the conditions of the process in said input memory portion in accordance with said second signal; and

display means for selectively displaying conditions of a sequence program stored in said input and output memory portions of said buffer memory; whereby, when the conditions of the process are sequentially applied to said input memory portion and the control signals for the process are applied from said output memory portion to the process through said process I/O unit and said connecting means in response to said control means, said display means displays operating conditions of a sequence program selected by said setting means in accordance with the conditions of the process set in said input memory portion through said process I/O unit, and when said connecting means disconnects said process I/O unit from said buffer memory, said display means displays operating conditions of a sequence program selected by said setting means in accordance with the signals indicative of conditions of the process which are set by said setting means and stored in said input memory portion.

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**4,298,959**

## DIGITAL INFORMATION TRANSFER SYSTEM (DITS) RECEIVER

**Frank D. Sundermeyer, Middletown, Conn., and Richard W. Calcasola, Longmeadow, Mass., assignors to United Technologies Corporation, Hartford, Conn.**

**Filed Nov. 23, 1979, Ser. No. 96,969**
**Int. Cl.³ G06F *3/04***
**U.S. Cl. 364—900** **9 Claims**

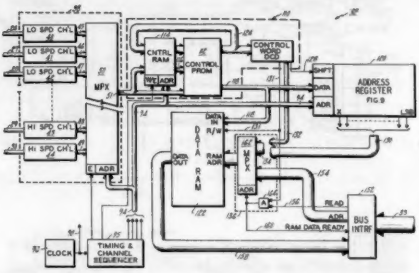
1. A digital information transfer system (DITS) receiver for storing in a direct memory access (DMA) for a signal processor, a desired number of data signals presented asynchronously at selected signal speeds to one or more DITS input channels as serial bit data words having an information field with a first byte data identification (ID) and one or more succeeding bytes of data intelligence, comprising:

data sampling means for sampling each input channel at least once within each succeeding signal speed period to provide a serial sample bit stream of sampled signal bits from each channel;

register means having a plurality of addressable locations therein for registering signal bits;

data memory means, having a plurality of identifiable signal storage locations therein, at least one associated with each of the desired number of data signals, each location providing storage therein of the signal bits of the associated data word; and

controller means, responsive to said serial sample bit stream,




for presenting the first byte ID signal bits of each data word to said register means for accumulation therein of the full first byte ID of each data word at the one of said addressable locations associated with the data word, and for presenting simultaneously, in response to each accumulated first byte ID, each sampled data intelligence signal bit of said data word together with said accumulated first byte ID signal associated therewith to said data memory means for storage therein at the one of said signal storage locations identified by said accumulated first byte ID signal.

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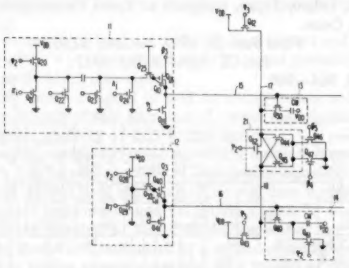
**4,298,960**

## MEMORY INTEGRATED CIRCUIT

**Kenjiro Mitake, and Osamu Kurakami, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan**

**Filed Sep. 28, 1979, Ser. No. 79,727**
**Claims priority, application Japan, Sep. 29, 1978, 53/120880**
**Int. Cl.³ G11C *11/40***
**U.S. Cl. 365—210** **19 Claims**



1. A memory circuit comprising:

a first digit line;

a second word line;

decoder means for operatively driving said first and second word lines, said decoder means being comprised of transistors having a first threshold voltage;

a memory cell including a first gate transistor having a gate coupled to said first word line and a drain coupled to said first digit line, and first capacitor means coupled between a source of said gate transistor and a potential source; and

a dummy cell including a second gate transistor having a gate coupled to said second word line and a drain coupled to said second digit line and a second capacitor means coupled between a source of said second gate transistor and said potential source;

wherein said first and second gate transistors are of the same channel type as that of said decoder transistors and have a second threshold voltage of the same polarity as that of said first threshold voltage, said second threshold voltage being smaller in absolute value than said first threshold voltage.

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**4,298,961**

## BIPOLAR MEMORY CIRCUIT

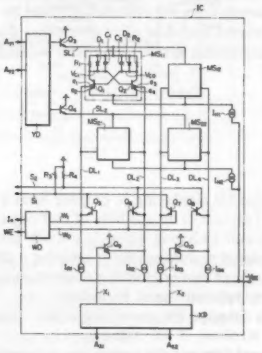
**Atsuo Hotta, Higashiyamato, and Yukio Kato, Kodaira, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed Apr. 16, 1980, Ser. No. 140,839**

**Claims priority, application Japan, Apr. 25, 1979, 54-50294**

**Int. Cl.³ G11C *11/40***

**U.S. Cl. 365—179** **3 Claims**



1. A memory circuit comprising: a matrix of memory cells arranged in rows and columns, each cell having a pair of multi-emitter transistors each of which having two emitters, collector and a base, the bases and collectors of said pair of multi-emitter transistors being cross-coupled to each other, one emitters of said pair of transistors being commonly connected to a stationary current source for providing a stationary current, whereas the other emitters of said pair of transistors being respectively connected to a pair of column lines, said collectors of said pair of transistors being connected to a row line through parallel circuits of a load resistance and a diode means, respectively; a pair of writing transistors being connected at their emitters to said pair of column lines respectively; and writing current source means connected to said pair of column lines for delivering a writing current; wherein, in the stationary state out of selection, the difference of collector voltages between said pair of multi-emitter transistors caused by the stationary current is set at a level higher than 0.6 V.

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**4,298,962**

## MEMORY

**Kuniyuki Hamano, and Toshiyuki Ohta, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan**

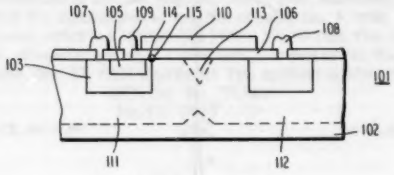
**Filed Jan. 25, 1980, Ser. No. 115,323**

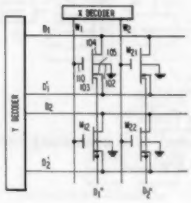
**Claims priority, application Japan, Jan. 25, 1979, 54-7988; Feb. 28, 1979, 54-22695**

**Int. Cl.³ G11C *11/40***

**U.S. Cl. 365—182** **8 Claims**

8. A memory comprising a semiconductor substrate of one conductivity type, first and second regions of the opposite conductivity type provided in said semiconductor substrate, a channel region located between said first and second regions, a control electrode provided on said channel region via an insulating film, and means for extending depletion layers from said first and second regions so as to isolate said channel region from said semiconductor substrate, and means for selectively




accumulating majority carriers of said semiconductor substrate in said channel region, the existence or non-existence of accumulation of said majority carriers in said channel region being made to correspond to the stored information.

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**4,298,963**

## JETTISONING AND FLOTATION DEVICE FOR A SUSPENDED LOAD, PARTICULARLY AN UNDERWATER LISTENING BODY

**Roger M. Dejob, Verrieres-le-Buisson, and Marcel P. Tardivon, Fontenay aux Roses, both of France, assignors to Etat Francais represente par le Delegue Ministeriel pour l'Armement, Paris-Armees, France**

**Filed Nov. 28, 1975, Ser. No. 635,680**

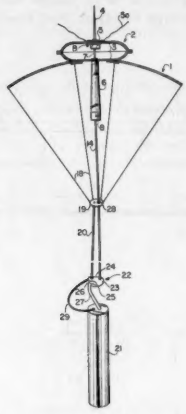
**Claims priority, application France, Nov. 28, 1974, 74 38948; Sep. 11, 1975, 75 27818**

**Int. Cl.³ H04B *1/59***

**U.S. Cl. 367—4** **14 Claims**

1. Apparatus for use in the jettisoning and flotation of a suspended load, particularly an underwater listening device, comprising a parachute for suspending the load during descent between jettisoning and flotation, and at least one inflatable float for maintaining the load at a predetermined depth in a body of water, said float comprising an inflatable ballonet fixed in the central portion of said parachute, an inflation sleeve coupled at one end to said ballonet and open for influx of air at its free other end for inflating said ballonet with superatmospheric air pressure generated by the descent of said parachute, and a tension member fixed at one end to said free end of said sleeve and adapted for coupling of its other end to the load so as to extend said sleeve downwardly during descent with its free end facing downwardly, wherein said parachute is cruciform and said ballonet comprises two generally square pieces of fabric which are secured edge-to-edge such that the ballonet viewed in plan is of generally square shape, one of the pieces of fabric which forms said float being coupled with said inflation sleeve and constituting the central portion of the parachute and the lower surface of said ballonet, the branches of which parachute are formed by rectangles of sheet-like material which are

secured to the lower piece of said ballonet at one of their smaller sides, and suspension lines extending from said parachute and connected to a connecting member adapted for connection to the load.



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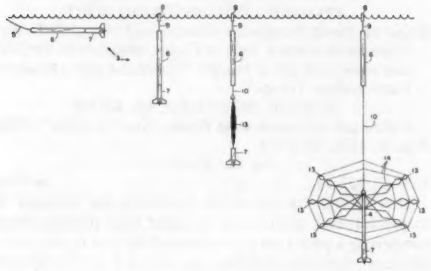
**4,298,964**

## TOWED DEPLOYMENT OF ACOUSTIC ARRAYS

**Paul L. Warnshuis, Jr., Rancho Santa Fe, and Peter V. Serrell, Solana Beach, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Apr. 21, 1980, Ser. No. 142,322**
**Int. Cl.³ H04R *1/44***
**U.S. Cl. 367—4** **20 Claims**



1. An instrumentation array support structure for use in a water medium, comprising:

a container means having a rounded nose and a bottom;

a separable tail portion fitted to said container means to close the bottom thereof;

an elongated support means joined to the top of said tail portion, said support means being slidable within said container means;

first reel and cable means connecting said support means with said container, whereby said support means can be moved into and out of said container on said cable means;

a plurality of scissor arms mounted on said support means by linkage means; and

driving means contained within said tail portion and connected to said linkage means for extending and retracting said scissor arms.

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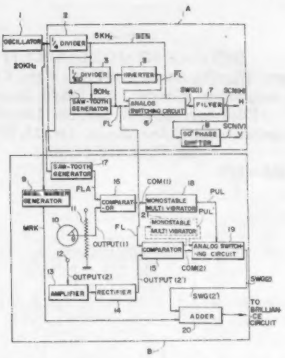
**4,298,965**

## DIRECTIVITY DISPLAY DEVICE AND METHOD

**Hiroshi Kogo, Ichikawa; Mamoru Tonooka, Ryugasaki; Teruhisa Aoki, Tokyo; Shigeo Ando, Minami-ashigara, and Raiji Tomiyama, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan**

**Filed Oct. 25, 1979, Ser. No. 88,127**
**Claims priority, application Japan, Nov. 1, 1978, 53-133743; Apr. 11, 1979, 54-46912[U]**
**Int. Cl.³ H04R *29/00***
**U.S. Cl. 367—13** **18 Claims**



1. A device for displaying in graphic form a property of an object as a function of an attribute of that object, comprising a scanning circuit including a first saw-tooth generator producing a scan signal and means for measuring a directional property of the object and converting a measurement signal into a brilliance modulation signal, including:

(a) a first detector for generating a first signal proportional to the attribute of the object,

(b) a second detector for generating a second signal indicating the current value of the property of the object,

(c) a second saw-tooth generator for generating a saw-tooth wave signal,

(d) a first comparator which compares the output of said first detector with said saw-tooth wave signal generated by the second saw-tooth generator to produce an output when said saw-tooth wave signal of said second saw-tooth generator is above the signal generated by said first detector,

(e) a second comparator which produces a signal dependent on the output of said first saw-tooth generator and the output of said second detector,

(f) a first pulse generator responsive to the output of said first comparator to produce pulses, and

(g) a switching circuit for switching the output of said second comparator gated by the pulses output from said first pulse generator to produce an output serving as a brilliance modulated signal.

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**4,298,966**

## REMOVAL OF SURFACE LAYER ANOMALY EFFECTS

**William H. Ruehle, Duncanville, Tex., assignor to Mobil Oil Corporation, New York, N.Y.**

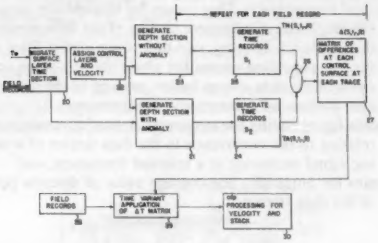
**Filed Jan. 22, 1979, Ser. No. 5,652**
**Int. Cl.³ G01V *1/32***
**U.S. Cl. 367—50** **8 Claims**

1. In seismic exploration wherein seismic energy reflected from subsurface layers is detected to produce seismograms, the method of removing from the travel time of said seismograms the distortion caused by travel through a layer anomaly comprising:

converting said travel time of said seismograms to a depth section of said layers including said anomaly;

generating from said seismograms a depth section of said layers without said anomaly;

converting the depth sections to reflection times for each subsurface layer with said anomaly and without said anomaly;



generating time corrections from said reflection times for each trace of said seismograms for each subsurface; and

time correcting said traces with said time corrections at the time of reflection from each of said subsurface layers.

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**4,298,967**

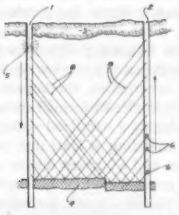
## HIGH RESOLUTION DOWNHOLE-CROSSHOLE SEISMIC REFLECTION PROFILING TO RESOLVE DETAILED COAL SEAM STRUCTURE

**Laric V. Hawkins, Cammeray, Australia, assignor to Unisearch Limited, Kensington, Australia**

**Filed Jun. 13, 1979, Ser. No. 48,541**

**Int. Cl.³ G01V *1/20, 1/40***

**U.S. Cl. 367—57** **6 Claims**



1. A method of seismic exploration and/or detecting seismic reflectors, including the steps of providing at least two adjacent drillholes extending below a surface weathered layer so that a seismic reflector extends between the drillholes; arranging a seismic source in one of the drillholes and a seismic receiver in at least the other drillhole and actuating the same so that seismic signals generated by the seismic source are reflected from the seismic reflector extending between the drillholes and then received by the seismic receiver; moving said seismic source and said seismic receiver relative to one another substantially vertically in mutually opposite directions, so that when one of said seismic source and seismic receiver is lowered, the other of said seismic source and seismic receiver is raised; and recording said seismic source and seismic receiver signals in conjunction with the relative movement between said seismic source and said seismic receiver.

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**4,298,968**

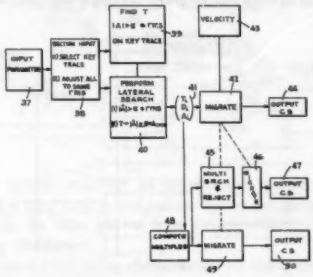
## DIGITAL REFLECTION SEARCHING AND SECTION PLOTTING

**William H. Ruehle, Duncanville, and John D. Hodge, Dallas, both of Tex., assignors to Mobil Oil Corporation, New York, N.Y.**

**Continuation of Ser. No. 863,766, Oct. 2, 1969, abandoned, which is a continuation of Ser. No. 696,661, Jan. 9, 1968, abandoned, which is a continuation of Ser. No. 607,123, Dec. 13, 1966, abandoned, which is a continuation-in-part of Ser. No. 516,609, Dec. 27, 1965, abandoned. This application Mar. 15, 1977, Ser. No. 777,806**

**Int. Cl.³ G01V *1/30***

**U.S. Cl. 367—59** **18 Claims**



9. The new use of an automatic digital computer and automatic plotting means to produce a migrated seismic section from seismic data including a plurality of traces represented by digital values at periodic sampling times on each trace and representing the occurrence times of seismic energy from a plurality of spaced sources and reflected from subsurface interfaces comprising:

adjusting the amplitude of each trace in said digital computer so that the rms level of each trace is equal for all traces,

converting said seismic data in said digital computer to a first physical representation of the occurrence time of energy reflected from a particular subsurface interface and a second physical representation of the attitude of said particular subsurface interface,

migrating in said digital computer said first physical representation of occurrence time and said second physical representation of attitude to values representating actual depth and horizontal displacement with respect to said sources, and

plotting said particular subsurface interface at the attitude and actual depth and horizontal displacement of said particular subsurface interface.

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**4,298,969**

## METHOD AND APPARATUS FOR TESTING THE IMPEDANCES OF GEOPHONE CHANNELS

**James E. Rickenbacker, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.**

**Filed Sep. 26, 1979, Ser. No. 78,868**

**Int. Cl.³ G01V *1/16, 1/00;* G01C *27/00***

**U.S. Cl. 367—76** **6 Claims**

1. An apparatus for testing the impedances of a plurality of geophone channels of a seismic data gathering device, said apparatus comprising:

a plurality of current sources which feed test currents into the geophone channels to develop a test voltage across each channel that is proportional to that channel's impedance;

a comparator for each geophone channel, said comparator being connected to each channel to compare the test voltage for that channel with a high reference voltage that is propor-

tional to the maximum acceptable impedance for that channel and with a low reference voltage that is proportional to the minimum acceptable impedance for that channel; and

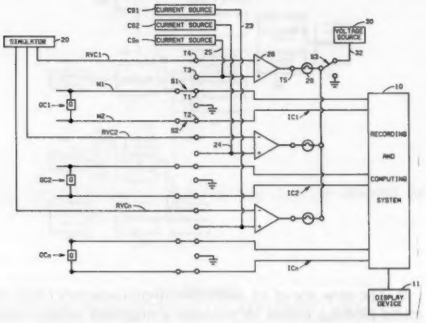
a simulator for developing the high and low reference voltages for each channel, said simulator being connected to each channel and comprising

a first voltage source providing a first voltage which is proportional to the lowest nominal impedance of the geophone channels;

a second voltage source providing a second voltage which is proportional to the highest nominal impedance of the geophone channels;

a first operational amplifier having a first gain setting and a second gain setting and receiving said first voltage at one of its input terminals;

a second operational amplifier having a first gain setting and




a second gain setting and receiving said second voltage at one of its input terminals, said first and second gain settings being substantially equal to those of the first operational amplifier;

a voltage divider coupled to the output terminals of the operational amplifiers, said voltage divider providing a series of high reference voltages proportional to the maximum acceptable impedances of the geophone channels when said amplifiers are on their first gain settings and said voltage divider providing a series of low reference voltages proportional to the minimum acceptable impedances of the geophone channels when said amplifiers are on their second settings; and

means connected to said amplifier for controlling the gain settings of the amplifiers,

whereby a measurement is made for each channel whether the impedance of that channel falls within acceptable limits.

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**4,298,970**

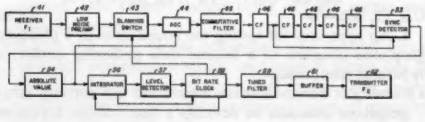
**BOREHOLE ACOUSTIC TELEMETRY SYSTEM SYNCHRONOUS DETECTOR**

**E. Neil Shawhan, West Chester, Pa.; Octavio A. Vela, and Miles A. Smither, both of Houston, Tex., assignors to Sperry-Sun, Inc., Sugar Land, Tex.**

**Filed Aug. 10, 1979, Ser. No. 65,475**

**Int. Cl.[3] G01V *1/40*; H04B *1/16***

**U.S. Cl. 367—82** **19 Claims**




1. In a borehole telemetry system for passing acoustic signals in the form of a data stream over an elongated column acting as an acoustic path in the borehole, such acoustic signals having a data component embedded in a high level of noise, circuit means for filtering noise from the signal to provide a useable data component, which means comprises:

first commutative filter means for filtering noise components of the data stream which occur at frequencies outside a narrow frequency band;

second commutative filter means for sequentially measuring the amplitude of a discrete portion of the data stream after the frequency filtering, said first commutative filter means further providing means for phase shifting noise components of the data stream before passage of the data stream into the second commutative filter means;

means for operating the sequential measuring means in timed relation to the occurrence in the data stream of a switching signal occurring at a selected frequency; and

means for outputting the average value of discrete portions of the data stream.

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**4,298,971**

**ELECTRONIC TIMPIECE**

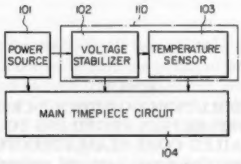
**Shigeru Morokawa, Higashiyamato, and Keiichiro Koga, Tokorozawa, both of Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan**

**Filed Jan. 5, 1979, Ser. No. 1,260**

**Claims priority, application Japan, Jan. 11, 1978, 53/1751**

**Int. Cl.[3] G04B *17/20, 1/00***

**U.S. Cl. 368—204** **9 Claims**




1. In an electronic timepiece powered by a battery and having an integrated circuit chip including a standard frequency signal source for providing a signal of relatively high frequency, frequency divider means responsive to said relatively high frequency signal for producing a relatively low frequency signal, drive signal generator means responsive to said relatively low frequency signal for producing drive signals, and display means responsive to said drive signals for providing a time information, the improvement comprising:

a voltage stabilizer circuit formed on said integrated circuit chip for producing a stabilized voltage, said voltage stabilizer circuit including at least one combination of a non-linear element and a current mirror circuit, in which said at least one combination of said non-linear element and said current mirror circuit provides a basic voltage to cause said stabilized voltage to be produced by said voltage stabilizer circuit; and

a temperature sensor formed on said integrated circuit chip and driven by said stabilized voltage.

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**4,298,972**

**ALARM SIGNALING TIME DETECTING DEVICE FOR LEAF TYPE DIGITAL CLOCK**

**Masuo Ogihara; Kozo Chimura; Nobuo Shinozaki, and Yoichi Seki, all of Yotsukaido, Japan, assignors to Seiko Koki Kabushiki Kaisha, Tokyo, Japan**

**Filed Dec. 27, 1979, Ser. No. 107,553**

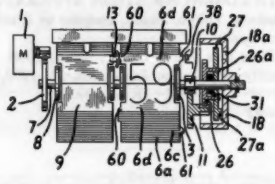
**Claims priority, application Japan, Dec. 28, 1978, 53-163742**

**Int. Cl.[3] G04B *19/02*; G04C *21/16***

**U.S. Cl. 368—222** **3 Claims**

1. In an alarm time detecting device for a leaf type digital clock which includes an hour time wheel; minute leaves successively positioned for viewing to show the passage of min-

utes, wherein certain ones of said minute leaves have a respective projection extending therefrom and the remaining ones of said minute leaves lack a projection corresponding to said respective projections of said certain minute leaves; a first detecting member angularly positionable relative to said hour time wheel for engaging said hour time wheel at an alarm time corresponding to the angular position of said first detecting member and for producing a mechanical signal when said hour time wheel is engaged; a first detecting lever positionable by said first detecting member; a second detecting lever positionable by said first detecting lever and positionable to be unaffected by setting of the alarm time and cooperative with said minute leaves for producing a second mechanism signal; and an




alarm device actuated when both the first and the second mechanical signals occur; the improvement comprising: said second detecting lever dimensioned to be positioned by said first detecting lever so as to be clear of said minute leaf projections before said first detecting member produces the first mechanical signal and for moving to be engaged by said minute leaf projections after said first detecting member has engaged said hour time wheel and produced the first mechanical signal; and said second detecting lever being released by said minute leaf projections as said minute leaves are successively positioned for viewing to release said second detecting lever for further movement which constitutes said second mechanical signal.

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**4,298,973**

## STRUCTURE FOR COUPLING BACK COVER WITH CASE BAND IN WRIST WATCH

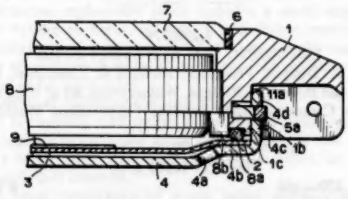
**Motoyuki Saito, Tanashi, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan**

**Filed Dec. 22, 1980, Ser. No. 218,703**

**Claims priority, application Japan, Dec. 26, 1979, 54-184679[U]**

**Int. Cl.³ G04B *37/00***

**U.S. Cl. 368—276** **5 Claims**




1. A structure for coupling a back cover with a case band in a wrist watch comprising a case band having a long groove on the outer wall of a band attaching portion, a spring member being fitted in said long groove of the case band so as to outwardly project a protruded portion of said spring member and a part thereof being fixed to said case band, a back cover having a side wall with a long hole bored at the position corresponding to that of said spring member, and an elastic member for energizing and engaging said back cover with said case band along the axial direction thereof so as to cover a module.

**4,298,974**

## OPTICAL HEAD FOR A VIDEODISC PLAYER/RECORDER

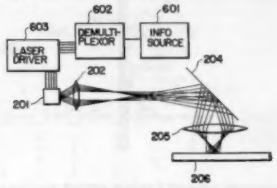
**Yoshito Tsunoda, Mitaka; Kimio Tatsuno, Kokubunji; Toshimitsu Miyauchi, Hachioji; Kunio Aiki, Hachioji, and Ryoichi Ito, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed May 10, 1979, Ser. No. 37,898**

**Claims priority, application Japan, May 10, 1978, 53-54502**

**Int. Cl.³ G11B *7/14***

**U.S. Cl. 369—45** **8 Claims**




1. An optical head for an information recording system including a laser source and optical means for guiding a laser beam from the laser source to a predetermined information recording medium,

said optical head being characterized in that a semiconductor laser array of a plurality of lasing points formed on a common base plate is employed as said laser source, said optical means being arranged in common to receive the laser beams from the lasing points of said semiconductor laser array and to project said beams onto predetermined points of said information recording medium, first drive means for pulse modulating at least two of said plurality of lasing points in said semiconductor laser array including a source of multiplexed signals, a demultiplexer connected to said source and a driver circuit connecting the outputs from said demultiplexer to respective lasing points, and second driver means for continuously oscillating at least one of the remaining lasing points in said semiconductor laser array.

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**4,298,975**

## OPTICAL RECORDING MEDIUM AND METHOD OF OPTICALLY RECORDING INFORMATION THEREON

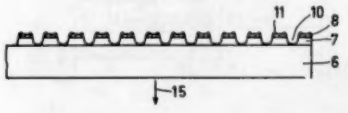
**Jan van der Veen; Petrus J. Kivits, and Marinus R. J. de Bont, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Mar. 19, 1979, Ser. No. 21,397**

**Claims priority, application Netherlands, Jan. 15, 1979, 7900281**

**Int. Cl.³ G11B *3/74, 7/00*; G01G *15/34*; G01D *15/34***

**U.S. Cl. 369—94** **12 Claims**




1. A recording system comprising a means for providing an information modulated laser beam and a recording medium positioned in the path of said laser beam, said recording medium comprising a substrate, transparent to said laser beam, provided on at least one side with a recording layer consisting at least substantially entirely of a compound of phthalocyanine and a metal, metal oxide or a metal halide.

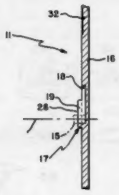
## 4,298,976
## MICROPHONOGRAPH RECORD

**Ronald D. Irvin, 135 Belwood Gateway, Los Gatos, Calif. 95030; Steven R. Runyan, 4265 Ruthelma St., Palo Alto, Calif. 94307, and Hugh P. Sherlock, 1275 Dana Ave., Palo Alto, Calif. 94301**

**Continuation of Ser. No. 532,329, Dec. 13, 1974, abandoned. This application Jan. 31, 1977, Ser. No. 764,004**

**Int. Cl.³ G11B** *3/68*

**U.S. Cl. 369—282** **3 Claims**




1. A stationary record having sound grooves on a sheet of plastic material, said record having a generally V-shaped locating means formed on one surface of said sheet of material and being accessible to a registration pin from the same side, said V-shaped locating means comprising a recess lying in a plane generally parallel to the plane of the sheet of material, said V-shaped locating means further comprising ribs extending above said sound grooves carried by the sheet of material being located on the same surface as the V-shaped locating means, said sound grooves being arranged in a generally spiral pattern, the pattern of said sound grooves having proximate their center a point which lies in close proximity to the apex of the V-shaped locating means.

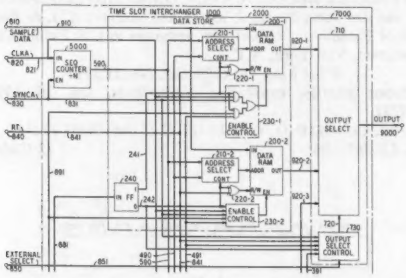
## 4,298,977
## BROADCAST AND ALTERNATE MESSAGE TIME SLOT INTERCHANGER

**Robert P. Abbott, Freehold Township, Monmouth County; Ming-Chwan Chow, Holmdel; Anthony J. Cirillo, Cranford; Rudolph C. Drechsler, Freehold Township, Monmouth County, and Lee F. Horney, II, Fair Haven, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Sep. 10, 1979, Ser. No. 73,849**

**Int. Cl.³ H04Q** *11/04;* **H04M** *3/56*

**U.S. Cl. 370—62** **5 Claims**




4. Apparatus for interchanging time slots (**1000**) said interchanging apparatus including an input terminal (**810**) adapted to receive an input frame, said input frame having a first plurality of input time slots, each input time slot for communicating a sample of information;

data storage means (**2000**) having a plurality of storage locations;

means for extending an input time slot sample from an input time slot through a storage location to an output time slot and thence to an output terminal (**9000**) for insertion in an output frame, said output frame having a second plurality of time slots and characterized in that said interchanging apparatus further comprises:

means (**3000, 710, 730**) for selectively substituting an alternate message in one or more output time slots in place of said input sample, said alternate message being different than said input sample, whereby said alternate message rather than said input sample may be broadcast through one or more output time slots to many locations.

## 4,298,978
## DATA COMMUNICATION APPARATUS

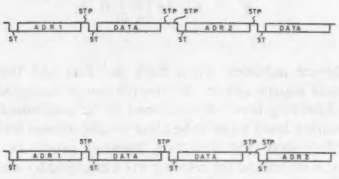
**Haruka Nakamura, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan**

**Filed Feb. 26, 1980, Ser. No. 124,996**

**Claims priority, application Japan, Mar. 6, 1979, 54-26444**

**Int. Cl.³ H04J** *6/00*

**U.S. Cl. 370—92** **6 Claims**




1. A data communication apparatus comprising:

transmission means for selectively transmitting groups of address signals and groups of data signals, each group of address signals comprising a start bit, a predetermined number of address bits and a stop bit, each group of data signals preceding another group of data signals comprising a start bit, said predetermined number of data bits and a stop bit, each group of data signals preceding a group of address signals comprising a start bit, said predetermined number of data bits and two stop bits; and

reception means for receiving groups of signals, the reception means comprising sensor means for sensing, in a group of signals, a bit following said predetermined number of bits plus two bits and processing a next group of signals as a group of address signals when said sensed bit is a stop bit and processing a next group of signals as a group of data signals when said sensed bit is a start bit.

## 4,298,979
## DECODING TIM BUS STRUCTURE

**Thomas R. Dobyns, Frederick; Richard R. Lindstrom, Brunswick, and Robert P. Ridings, Walkersville, all of Md., assignors to Communications Satellite Corporation, Washington, D.C.**

**Filed Sep. 27, 1979, Ser. No. 79,655**

**Int. Cl.³ H04J** *3/06*

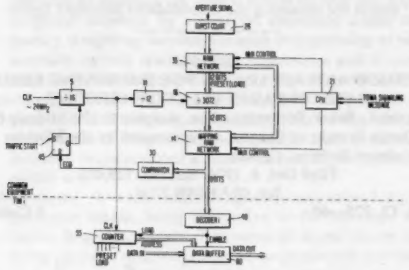
**U.S. Cl. 370—104** **8 Claims**

2. In a data communications system having a plurality of stations, each of said stations transmitting a burst of data at a selected time, each burst having a plurality of channel portions, each station receiving selected channel portions of selected bursts of data, an apparatus for allocating said selected channel portions of selected bursts to said stations comprising:

(a) means for counting and tracking said bursts of data to provide an initialization signal;

(b) means receiving said initialization signal and a clock signal for counting said channel portions of data and for providing a portion count output;

(c) means receiving said portion count output for providing a selection signal;



(d) wherein said means for counting said channel portions is preset in accordance with said initialization signal, said presetting occurring for each new burst of data.

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**4,298,980**

## LSI CIRCUITRY CONFORMING TO LEVEL SENSITIVE SCAN DESIGN (LSSD) RULES AND METHOD OF TESTING SAME

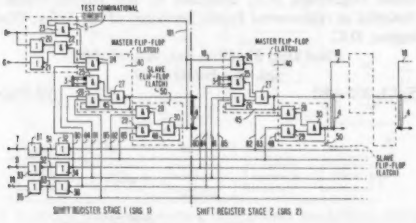
**Johann Hajdu, and Guenter Knauft, both of, Boeblingen, Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Jul. 26, 1979, Ser. No. 60,932**

**Claims priority, application Fed. Rep. of Germany, Sep. 30, 1978, 2842750**

**Int. Cl.³ G01R *31/28;* G06F *11/00***

**U.S. Cl. 371—25** **5 Claims**



**1.** A method of testing an electronic system comprised of a plurality of interconnected minimum replaceable units, each of said minimum replaceable units includes a multi stage shift register having an input, an output, and shift contorls, and a test combinational circuit connected to said multi-stage shift register wherein each stage of each said shift register includes a master and a slave latch:

said method including the following steps:

(a) connecting said stages of each said multi-stage shift register of each said minimum replaceable unit to form a single large shift register having a input, an output, and shift controls;

(b) upon occurrence of a test pulse, utilizing said test combinational circuit of each said minimum replaceable unit to set a predetermined binary bit pattern in only a portion of each multi-stage shift register of each minimum replaceable unit;

(c) upon occurrence of a shift pulse utilizing said shift controls of said single large shift register to shift out the bit content of said single large shift register; and

(d) examining the shifted-out bit content of said single large shift register at the output of said single large shift register to determine whether or not said shifted-out bit content faithfully provides said predetermined bit pattern previously set in only a portion of each said multi-stage shift register of each minimum replaceable unit, whereby from examination of said shifted out bit pattern a minimum replaceable unit having a defective multi-stage shift register may be identified.

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**4,298,981**

## DECODING SHORTENED CYCLIC BLOCK CODES

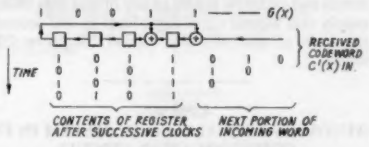
**Roger G. Byford, London, England, assignor to British Broadcasting Corporation, London, England**

**Filed Mar. 29, 1979, Ser. No. 25,169**

**Claims priority, application United Kingdom, Mar. 31, 1978, 12749/78**

**Int. Cl.³ G06F *11/10***

**U.S. Cl. 371—37** **3 Claims**




**1.** A method of decoding a shortened cyclic block code, comprising the steps of serially shifting a received codeword forwardly through a bidirectional syndrome register while so subtracting a generator word from the register content as to effect division of the received codeword, leaving the remainder in the register, and if the order of the remainder is not less than the number of bits in a maximum length correctable error, so reverse shifting the contents of the register as to reverse the division operation until the remainder is less than the number of bits in a maximum correctable error, and then combining the register contents with the received codeword to produce a corrected word.

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**4,298,982**

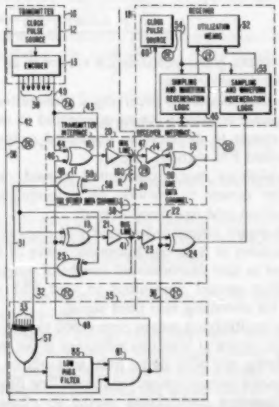
## FAULT-TOLERANT INTERFACE CIRCUIT FOR PARALLEL DIGITAL BUS

**Victor Auerbach, Hamilton Square, N.J., assignor to RCA Corporation, New York, N.Y.**

**Filed Jun. 3, 1980, Ser. No. 156,264**

**Int. Cl.³ G06F *11/00***

**U.S. Cl. 371—30** **10 Claims**



**1.** In a system comprising a transmitter for generating N data signals each having first and second logic levels, a receiver for receiving said N signals and N data channels each comprising

bus means for transmitting said N signals, a circuit means for detecting and correcting a stuck signal level condition on one of said bus means and comprising in each data channel;

first and second Exclusive OR gate means each having first and second input means and an output means;

means for supplying one of said data signals to said first input means of said first Exclusive OR gate means and for supplying the output of said second Exclusive OR gate means to said receiver; and

bus means connecting the output means of said first Exclusive OR gate means to the first input means of said second Exclusive OR gate means; and

logic means responsive to equal signal logic levels of said bus means and said data signals of all of said data channels to supply said first signal logic level to the second input terminals of said first and second Exclusive OR gate means and responsive to unequal signal levels of said bus means and said data signals of any of said data channels to supply said second signal logic level to said second input terminals of said first and second Exclusive OR gate means.

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**4,298,983**

## AUTOMATIC EQUALIZATION SYSTEM IN FM COMMUNICATION CIRCUIT

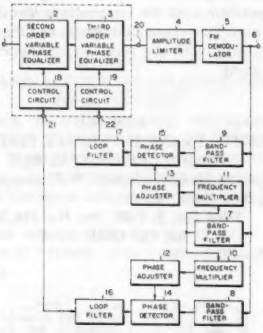
**Kazuo Kawai, Yokohama; Hidetaka Yanagidaira, Omiya, and Michitoshi Tamori, Tokyo, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan**

**Filed Oct. 26, 1979, Ser. No. 88,521**

**Claims priority, application Japan, Oct. 27, 1978, 53/131708; Nov. 29, 1978, 53/146583**

**Int. Cl.³ H09B *15/00***

**U.S. Cl. 375—12** **2 Claims**




1. An automatic phase equalization system in an FM communication circuit comprising:

input terminal means for receiving a transmitted FM signal;

variable phase equalizer means connected to said input terminal means to develop an equalized output from said transmitted FM signal;

FM demodulator means connected to said variable phase equalizer means to provide an demodulated baseband output from said equalized output;

first filter means connected to said FM demodulator means for obtaining at least one harmonic wave of a pilot signal included in said demodulated baseband output;

second filter means connected to said FM demodulator means for obtaining said pilot signal;

frequency multiplying means connected to said second filter means to obtain at least one reference wave by frequency-multiplying said pilot signal from said second filter means;

phase detector means connected to said first filter means and said frequency multiplying means to phase-detect said harmonic wave by the use of said reference wave as a reference so as to develop at least one detected output;

control means connected to said phase detector means and said variable phase equalizer means for controlling said variable phase equalizer means by the detected output to reduce the level of said harmonic wave; and

output terminal means connected to said FM demodulator means for obtaining the demodulated baseband signal.

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**4,298,984**

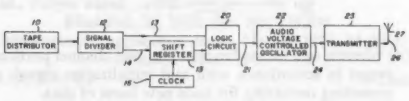
## METHOD AND APPARATUS FOR IMPROVING ERROR RATE ON RADIO TELETYPE CIRCUITS

**Charles L. Baker, Richardson, Tex., assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Canada**

**Filed Oct. 6, 1976, Ser. No. 729,084**

**Int. Cl.³ H04B *7/06***

**U.S. Cl. 375—40** **8 Claims**




1. A time diversity method of transmitting binary coded data comprising dividing said data into first and second identical data streams, delaying the data in said second data stream by a predetermined number of frames, subsequently making a comparison of the data in said first and second data streams and producing one-of-four digital signals dependent on said comparison, using said one-of-four signals to produce corresponding audio tones, and transmitting a carrier modulated by said audio tones.

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**4,298,985**

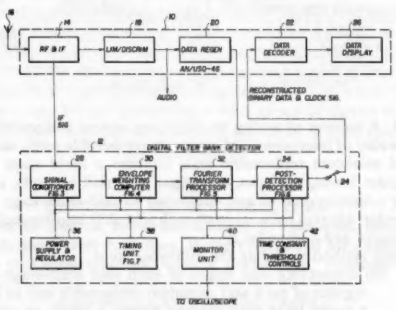
## DIGITAL FILTER BANK DETECTOR

**Arthur H. Ballard, Bethesda, Md., and Theodore J. Klein, Atlantic Highlands, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Dec. 31, 1979, Ser. No. 108,903**

**Int. Cl.³ H03D *7/00***

**U.S. Cl. 375—82** **10 Claims**




1. A digitally synthesized filter bank detector incorporated in a radio receiver for recovering a communications signal from a received radio signal including said communications signal, comprising in combination:

means for converting said received radio signal to a sequence of multi-bit digital words at a predetermined sampling rate;

first digital processor means coupled to said converting means, being responsive to said sequence of digital words, and operable to multiply the digital words by a desired envelope weighting function representing one of a plurality of substantially like filters sought to be simulated;

second digital processor means coupled to said first digital processor means, being responsive to the envelope-weighted sequence of digital words provided thereby, and operable to multiply the digital words of said envelope-weighted sequence by a constant amplitude center frequency weighting function for each of a plurality of substantially equally spaced center frequencies and to compute the envelope amplitudes of said digital words thereat;

said first and second digital processor digitally implementing thereby a bank of contiguous digital filters having substantially the same shape of frequency response and differing in center frequency over a predetermined frequency bandwidth; and

third digital processor means coupled to said second digital processor means, being responsive to the envelope and center frequency weighted sequence of digital words, and being operable to demodulate said sequence and provide a digital representation of said communications signal which is then adapted to be decoded and displayed by said radio receiver.

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**4,298,986**

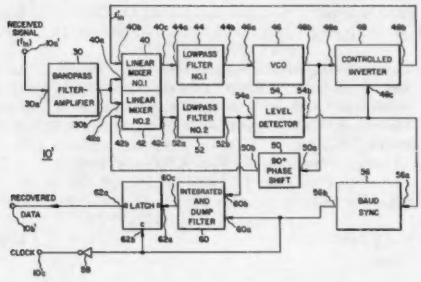
## RECEIVER FOR PHASE-SHIFT MODULATED CARRIER SIGNALS

**William C. Hughes, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.**

**Filed Dec. 26, 1979, Ser. No. 106,451**

**Int. Cl.³ H04L** *27/22, 27/06;* **H03D** *3/22*

**U.S. Cl. 375—84** **23 Claims**




1. A receiver for recovering digital data modulated upon a carrier waveform in a digital communications system, comprising:

means for receiving said carrier modulated by daid digital data;

means for band-pass filtering the received modulated carrier;

loop means receiving the band-pass filtered modulated carrier for providing a loop signal having a frequency essentially locked to the frequency of the received modulated carrier;

means for mixing said loop signal with the bandpass-filtered modulated carrier to form a output signal responsive to the phase difference therebetween;

means for low-pass filtering said mixing means output signal to recover the digital data from said modulated carrer;

means receiving the low-pass-filtered output signal for recovering a baud synchronization signal therefrom, and including means for providing a pulse at each transition at the recovered digital data waveform received from said low-pass filtering means;

means for providing a local clock waveform at first and second frequencies respectively greater than and less than the nominal frequency of the transitions of the recovered digital data waveform;

means for detecting the magnitude of the timing difference between said transition pulses and the transitions of said local clock waveform; and

means for controlling the percentage of time during which each of said first and second frequencies is provided by said local clock waveform providing means responsive to the dectected transition timing difference information, to cause the local clock and digital data waveform transitions to occur essentially simultaneously; said local clock waveform being the local baud synchronizing signal.

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**4,298,987**

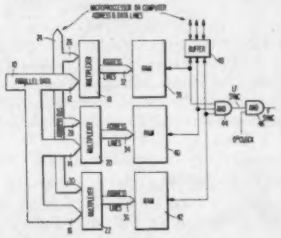
## MEMORY-BASED FRAME SYNCHRONIZER

**Raymond J. Stattel, Lanham, and James K. Niswander, Silver Spring, both of Md., assignors to The United States of America as represented by the Administrator, National Aeronautics and Space Administration, Washington, D.C.**

**Filed Mar. 12, 1980, Ser. No. 129,779**

**Int. Cl.³ H04J** *3/06, 6/00*

**U.S. Cl. 375—106** **4 Claims**



1. A frame synchronizer for use in a serial digital communications system, the frame synchronizer being of the type having a serial-to-parallel converter with a parallel data bus, at least one sync word comparator, a computer driven address bus, and counter and control logic circuits, wherein said sync word comparator comprises:

a multiplexer connected to and driving a random access memory by and through address lines,

said multiplexer having two sets of parallel inputs, one set being connected to said parallel data bus which may contain a desired sync word and the other set being connected to said address bus which transmits said desired sync word, said multiplexer periodically outputting said desired sync word and normally outputting data from said parallel data bus, and

said random access memory providing a unique logic output upon receiving the desired sync word from said multiplexer.

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**4,298,988**

## DIGITAL CHANNEL SELECTION AND FINE TUNING SYSTEM

**Charles L. Dages, Colmar, Pa., assignor to Jerrold Electronics Corp., Hatboro, Pa.**

**Continuation-in-part of Ser. No. 10,408, Feb. 8, 1979. This application Aug. 10, 1979, Ser. No. 65,515**

**Int. Cl.³ H04B** *1/26*

**U.S. Cl. 455—182** **7 Claims**

1. A closed loop double heterodyne digital tuning system, the system comprising,

first local oscillator means responsive to a variable control voltage for generating an oscillation having a frequency dependent on the magnitude of said control voltage,

sampling means for sampling the actual output frequency of said oscillator means for a predetermined interval of time and for generating a first digital word representing the actual value of said frequency,

means responsive to incoming channel information for gen-

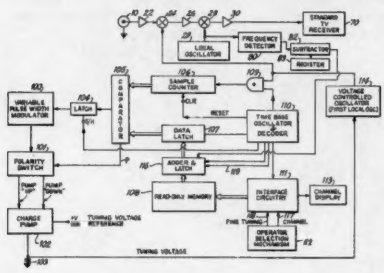
erating a selected one of plurality of address words, each address word representing a particular video operating channel,

storage means for storing a plurality of second digital words, each of the second digital words representing a desired nominal value of frequency for said oscillator means,

means responsive to the address words for retrieving from said storage means one of said second digital words, the particular location of said second digital word within said storage means being identified by said address word,

a second local oscillator,

second local oscillator drift correcting means including means for sensing the output frequency of said second local oscillator, and means connected to said sensing



means for generating a third digital word representative of the frequency variation of said second local oscillator,

means for combining said third digital word with the second digital word retrieved from said storage means and for storing the results of such combination,

comparator means for comparing the values of said first digital word with the value of said stored combined second and third digital words, and

means responsive to a difference in value between said first digital word, and said stored second and third digital words determined by said comparator means for varying said control voltage for said oscillator means, whereby said actual frequency value is changed to the correct frequency value.

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**4,298,989**

## TUNING APPARATUS

**Noboru Someno, Tokyo; Michimasa Komatsubara, Chiba, and Masakatsu Toyoshima, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan**

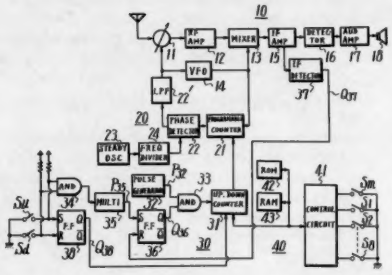
**Filed Jan. 11, 1980, Ser. No. 111,188**

**Claims priority, application Japan, Jan. 17, 1979, 54-4294**

**Int. Cl.[3] H04B 1/06**

**U.S. Cl. 455—183** **18 Claims**

1. Tuning apparatus for a radio receiver, comprising an adjustable tuning section having a tuning condition which is adjustable over a frequency range to be tuned to selected broadcast frequencies; an IF section coupled to said tuning section to produce an IF signal; IF detecting means for detecting whether said IF signal corresponds to a signal received on a broadcast frequency to which said tuning section is tuned, said detecting means producing a tune indicating signal when said tuning section is tuned to a broadcast frequency and said received signal is either a relatively high or a relatively low level signal and said detecting means producing said tune indicating signal when said tuning section is tuned to a frequency within a predetermined amount of said broadcast frequency and said received signal is a relatively high level signal; adjusting means for changing the tuning condition of said tuning section in predetermined frequency steps selectively in an upward or downward direction; and sensing means for sensing that said tune indicating signal has been produced to enable said adjusting means to change the tuning condition of said tuning section by predetermined frequency step and then to (a) disable said adjusting means if said tune indicating signal is sensed following the change by said predetermined frequency step of said tuning condition so as to maintain the



last-attained tuning condition thereof, or (b) return the tuning condition of said tuning section by said predetermined frequency step if said tune indicating signal is not sensed following said change by said predetermined frequency step of said tuning condition.

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**4,298,990**

## FREQUENCY CONVERTER OF ELECTROMAGNETIC RADIATION IN MILLIMETER AND SUBMILLIMETER WAVELENGTH RANGE

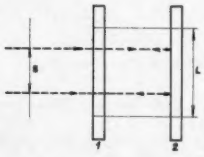
**Halina Bielska-Lewandowska, Warsaw, Poland; Natalija Irisova, Moscow, U.S.S.R.; Grzegorz Jung; Stanislaw J. Lewandowski, both of Warsaw, Poland; Aleksandr Prohorov, Moscow, U.S.S.R.; Roman Sobolewski, Warsaw, Poland, and Eugenij Vinogradov, Moscow, U.S.S.R., assignors to Polska Akademia Nauk Instytut Fizyki, Warsaw, Poland**

**Filed Nov. 19, 1979, Ser. No. 95,879**

**Claims priority, application Poland, Nov. 4, 1978, 210702**

**Int. Cl.[3] H04B 1/26; H02M 5/00**

**U.S. Cl. 455—325** **4 Claims**



1. A microwave frequency converter for receiving an electromagnetic radiation beam propagating in a direction to be incident on said converter, said beam being of a given cross-sectional size and microwave frequency, said converter comprising an open resonator having at least two spaced reflectors lying one behind the other in substantially parallel planes substantially normal to said direction, whereby an axis through centers of said reflectors is substantially aligned with an axis through a center of said beam, said reflectors being of a size larger than said given cross-sectional size, at least one of said reflectors comprising a plurality of parallel metallic conductors mounted on a flat dielectric surface and equidistantly spaced from one another by a distance less than the wavelength of said given microwave frequency, each conductor incorporating at least one Josephson junction.

# DESIGN PATENTS

## GRANTED NOV. 3, 1981

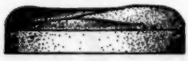
### ERRATA

| For CLASS | See PATENT NO. |
|---|---|
| D32–050 | 261,601 |
| D32–055 | 261,202 |
| D34–024 | 261,634 |
| D32–032 | 261,655 |

# DESIGNS

NOVEMBER 3, 1981

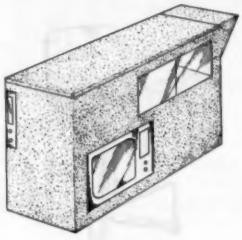
**261,570**
**CONTOURED SANDAL INNERSOLE**
**Andrew W. Gordon, Swampscott, and Carlman Fisher, Marblehead, both of Mass., assignors to Northern Shoe Bindings Co., Inc., Lynn, Mass.**
**Filed Jun. 25, 1979, Ser. No. 51,955**
**Term of patent 14 years**
**Int. Cl. D2—*04***
**U.S. Cl. D2—318**

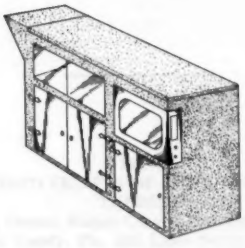


**261,571**
**TACKLE CADDY**
**George A. Hanson, 858 Crestview Dr., Palatine, Ill. 60067**
**Filed Apr. 13, 1979, Ser. No. 29,802**
**Term of patent 14 years**
**Int. Cl. D03—*02***
**U.S. Cl. D3—38**

**261,572**
**LUGGAGE BAG**
**Joseph Y. Pelavin, North Bergen, N.J., and Rene Lacoste, Paris, France, assignors to Lacoste Alligator S.A., Minneapolis, Minn.**
**Filed Mar. 7, 1980, Ser. No. 128,051**
**Term of patent 14 years**
**Int. Cl. D3—*01***
**U.S. Cl. D3—71**

**261,573**
**COMBINED ROOM DIVIDER, TELEVISION CABINET, STEREO CABINET, BAR AND AQUARIUM SUPPORT UNIT**
**Richard Lattimore, 504-B Saunders Pl., High Point, N.C. 27260**
**Filed Nov. 13, 1978, Ser. No. 960,583**
**Term of patent 14 years**
**Int. Cl. D06—*04***
**U.S. Cl. D6—4**

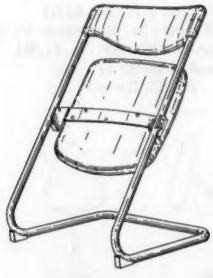




**261,574**
**PORTABLE HEAD REST**
**Sharon A. Lovejoy, 75 Spring St., Burlington, Vt. 05401**
**Filed Oct. 3, 1979, Ser. No. 81,561**
**Term of patent 14 years**
**Int. Cl. D6—*99***
**U.S. Cl. D6—29**

261,575
COMBINED STOOL AND FOOTREST
Jeffrey R. Fear, 207 Queens Quay West, Toronto, Ontario, Canada
Filed May 10, 1978, Ser. No. 904,719
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—35

261,576
CHAIR
Robert Heritage, London, England, assignor to Steelcase Inc., Grand Rapids, Mich.
Filed Jun. 22, 1978, Ser. No. 918,327
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—41



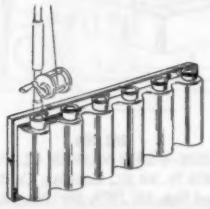
261,577
COMBINED CHAIR, TABLET ARM AND MAGAZINE RACK
Robert Heritage, London, England, assignor to Steelcase Inc., Grand Rapids, Mich.
Filed Jun. 22, 1978, Ser. No. 918,324
The portion of the term of this patent subsequent to Nov. 3, 1995, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*011*
U.S. Cl. D6—42

261,578
COMBINED CHAIR AND TABLET ARM
Robert Heritage, London, England, assignor to Steelcase Inc., Grand Rapids, Mich.
Filed Jun. 22, 1978, Ser. No. 918,325
The portion of the term of this patent subsequent to Nov. 3, 1995, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*05*
U.S. Cl. D6—42

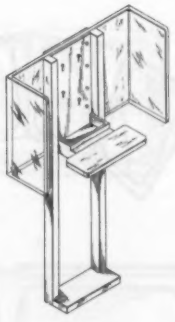
261,579
**COMBINED CHAIR, TABLET ARM, ASHTRAY AND MAGAZINE RACK**
Robert Heritage, London, England, assignor to Steelcase Inc., Grand Rapids, Mich.
Filed Jun. 22, 1978, Ser. No. 918,328
The portion of the term of this patent subsequent to Nov. 3, 1995, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*05*
U.S. Cl. D6—42

261,580
**CHAIR**
Gae Aulenti, Milan, Italy, assignor to Knoll International, Inc., New York, N.Y.
Division of Ser. No. 827,609, Aug. 25, 1977. This application Mar. 24, 1980, Ser. No. 133,656
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—66

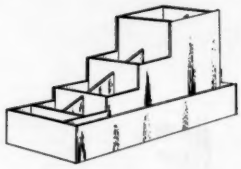
261,581
**FISHING ROD HOLDER**
Edward B. Buchanan, 15301 S. Bloomfield, Norwalk, Calif. 90650
Filed Nov. 23, 1979, Ser. No. 96,637
Term of patent 14 years
Int. Cl. D6—*04;* D8—*08;* D22—*05*
U.S. Cl. D6—125



261,582
**COMBINED TELEPHONE KIOSK AND SUPPORT THEREFOR**
Donald M. Genaro, Bergen County, N.J.; John N. McGarvey, Delaware County, Pa., and Lajos Novak, Bergen County, N.J., assignors to Western Electric Company, Inc., New York, N.Y.
Filed Mar. 28, 1978, Ser. No. 891,102
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D6—181

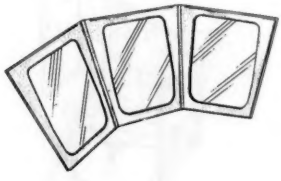


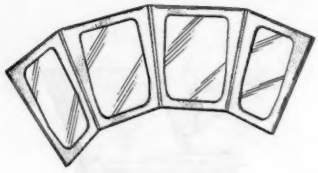
261,583
HOLDER FOR BAR ACCESSORIES
Manuel C. Labasan, 129 Kuhuoi St., Kahului, Hi. 96732
Filed Jun. 8, 1979, Ser. No. 46,687
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—189

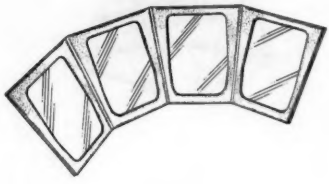


261,584
HIDE-A-BED MOVER CLAMP
Roy L. Enders, 978 N. 1st St., Banning, Calif. 92220
Filed Sep. 14, 1979, Ser. No. 75,597
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—198

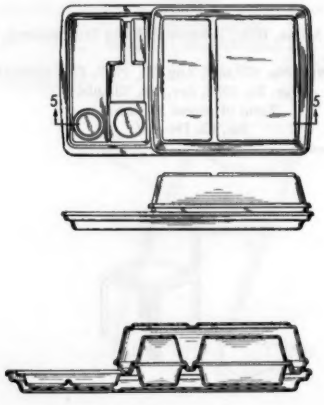
261,585
PICTURE DISPLAY FRAME
Donald B. Smith, R.R. #1, Mount Brydges, Ontario, Canada (N0L 1W0)
Filed Jun. 4, 1979, Ser. No. 44,844
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—234



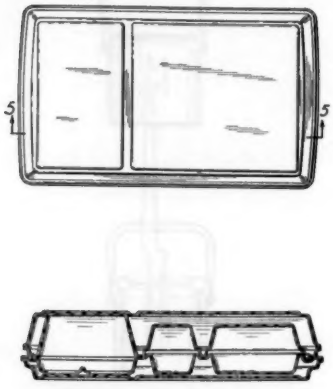




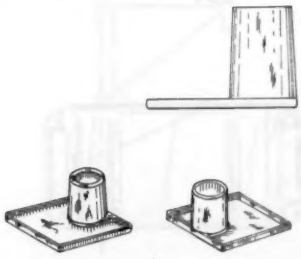
261,586
COVERED FOOD TRAY
Walter B. Herbst, Evanston, Ill., assignor to American Hospital Supply Corporation, Evanston, Ill.
Filed Sep. 17, 1979, Ser. No. 76,513
Term of patent 14 years
Int. Cl. D07—*99*
U.S. Cl. D7—16



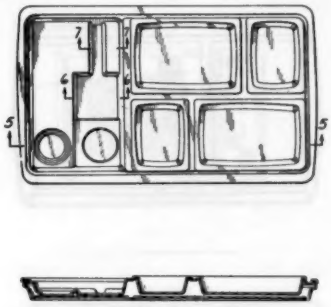
261,587
COVERED FOOD TRAY
Walter B. Herbst, Evanston, Ill., assignor to American Hospital Supply Corporation, Evanston, Ill.
Filed Sep. 17, 1979, Ser. No. 76,514
Term of patent 14 years
Int. Cl. D07—*99*
U.S. Cl. D7—16



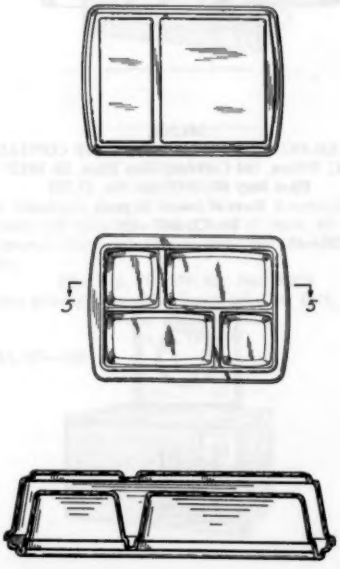
261,588
SERVING TRAY UNIT
Heinrich Fichte, Rotdornstrasse 5, 4005 Meerbusch, Fed. Rep. of Germany
Filed Aug. 24, 1979, Ser. No. 69,662
Claims priority, application Fed. Rep. of Germany, Feb. 24, 1979, 15MR397
Term of patent 14 years
Int. Cl. D07—*99*
U.S. Cl. D7—38



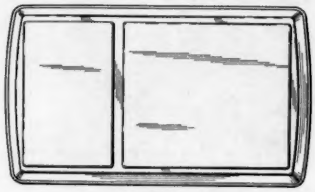
261,589
FOOD TRAY
Walter B. Herbst, Evanston, Ill., assignor to American Hospital Supply Corporation, Evanston, Ill.
Filed Sep. 17, 1979, Ser. No. 76,511
Term of patent 14 years
Int. Cl. D07—*99*
U.S. Cl. D7—38

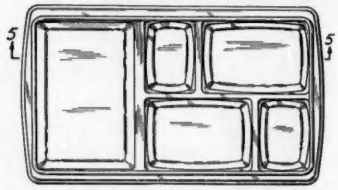


261,590
LID FOR A FOOD TRAY
Walter B. Herbst, Evanston, Ill., assignor to American Hospital Supply Corporation, Evanston, Ill.
Filed Sep. 17, 1979, Ser. No. 76,512
Term of patent 14 years
Int. Cl. D07—*99*
U.S. Cl. D7—40



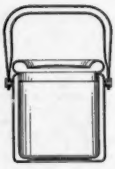
261,591
FOOD TRAY LID
Walter B. Herbst, Evanston, Ill., assignor to American Hospital Supply Corporation, Evanston, Ill.
Filed Sep. 17, 1979, Ser. No. 76,515
Term of patent 14 years
Int. Cl. D07—*99*
U.S. Cl. D7—40



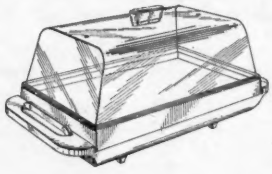


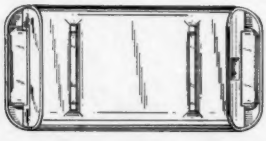
261,592
COASTER-HOLDER FOR A BEVERAGE CONTAINER
Michael C. Wilson, 164 Carleton, Glen Ellyn, Ill. 60137
Filed May 10, 1979, Ser. No. 37,735
Term of patent 14 years
Int. Cl. D07—*06*
U.S. Cl. D7—45

261,593
ICE PAIL
Toshio Miyazaki, Tsubame, Japan, assignor to Kabushiki Kaisha Miyazaki Seisakusho, Japan
Filed Jul. 30, 1979, Ser. No. 62,169
Claims priority, application Japan, Feb. 5, 1979, 54-4141
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—78



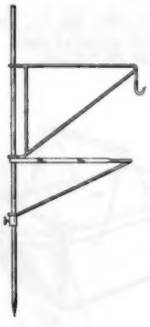
261,594
EGG COOKER
Melvin H. Boldt, Glenview; Thurber H. Morrison, Evanston, and Francis J. Greb, Palatine, all of Ill., assignors to National Presto Industries, Inc., Eau Claire, Wis.
Filed Mar. 5, 1979, Ser. No. 17,707
The portion of the term of this patent subsequent to Aug. 21, 1993, has been disclaimed.
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—94



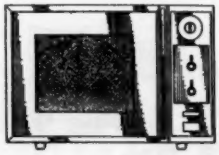


261,595
IMPLEMENT FOR SLIDING SHELVES
Bernard Yellin, Oak Brook, Ill., assignor to Bernard Industries Co., Chicago, Ill.
Filed Jul. 2, 1979, Ser. No. 54,374
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—99

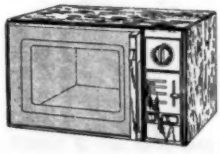
261,596
CAMPFIRE COOK STAND
Robert F. Beck, Jr., P.O. Box 0-14, R.R. #4, Delphi, Ind. 46923
Filed Dec. 17, 1979, Ser. No. 104,698
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—109



261,597
MICROWAVE OVEN
Yoshio Suganoya, and Takao Miyake, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed May 25, 1979, Ser. No. 42,282
Claims priority, application Japan, Dec. 4, 1978, 53-51516
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—128

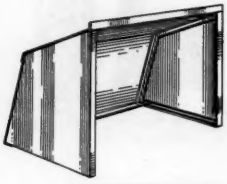


261,598
MICROWAVE OVEN
Yoichi Takahashi, Kouriyama; Masamichi Yamamura, Osaka; Toshio Harada, and Shigefumi Inoue, both of Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Sep. 17, 1979, Ser. No. 75,875
Claims priority, application Japan, Mar. 16, 1979, 54-10691
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—128

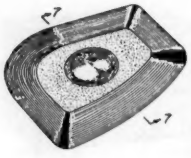


261,599
MICROWAVE OVEN
Yoichi Takahashi; Kenjiro Itsumi, both of Kouriyama; Toshio Harada, and Shigefumi Inoue, both of Nara, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Sep. 17, 1979, Ser. No. 75,879
Claims priority, application Japan, Mar. 16, 1979, 54-10689
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—128

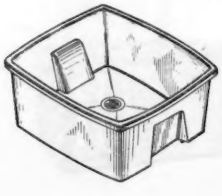
261,600
BARBECUE COWL
Robert S. Langtry, 17 W. Crescent St., McMahon's Point, New South Wales 2060, Australia
Filed Dec. 22, 1978, Ser. No. 972,371
Claims priority, application Australia, Jun. 23, 1978, 75133/78
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—129



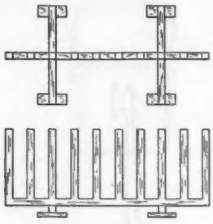
261,601
PAN CLEANER OR SIMILAR ARTICLE
John S. Kettlestrings, Wheaton, Ill., assignor to Enduro Corporation, Pella, Iowa
Filed Jul. 14, 1978, Ser. No. 924,871
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D32—40



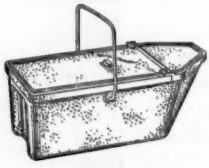
261,602
DISH PAN
Howard A. Anderson, Pittsburgh, Pa., assignor to Cities Service Company, Tulsa, Okla.
Filed Mar. 26, 1979, Ser. No. 24,239
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D32—55



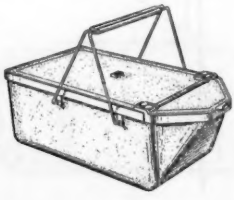
261,603
NEWSPAPER GRATE
Wilfred R. George, 16 Bonita Ave., Piedmont, Calif. 94611
Filed Jan. 9, 1980, Ser. No. 110,833
Term of patent 14 years
Int. Cl. D7—*08*
U.S. Cl. D7—207



261,604
CHARCOAL SCUTTLE
Thomas E. Wright, 6340 Americana Dr., Clarendon Hills, Ill. 60514
Filed Aug. 13, 1979, Ser. No. 66,250
Term of patent 14 years
Int. Cl. D7—*08*
U.S. Cl. D7—212



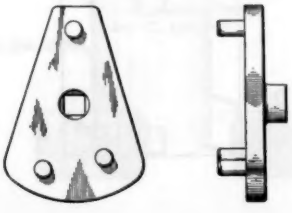
261,605
CHARCOAL SCUTTLE
Thomas E. Wright, 6340 Americana Dr., Clarendon Hills, Ill. 60514
Filed Feb. 11, 1980, Ser. No. 120,135
Term of patent 14 years
Int. Cl. D7—*08*
U.S. Cl. D7—212



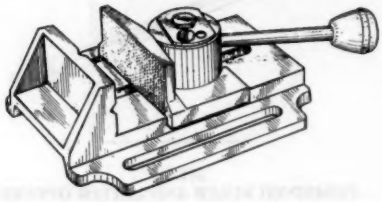
261,606
WHEEL HUB LOCKING TOOL
Mark J. La Fargo, 5127 Muscatel, and Robert V. Pomponio, 1040 E. Las Tunas Dr., both of San Gabriel, Calif. 91776
Filed Aug. 24, 1978, Ser. No. 919,391
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—21

261,607
RATCHET WRENCH FULCRUM RING
Robert V. Albertson, 2100 Shadywood Rd., Wayzata, Minn. 55391
Filed Nov. 21, 1977, Ser. No. 853,642
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—25

261,608
PUMP FLANGE TOOL
Carl F. Gunnell, III, 2965 Wilson Ave., Oakton, Va. 22124
Filed Dec. 6, 1978, Ser. No. 967,155
Term of patent 14 years
Int. Cl. D08—*05*
U.S. Cl. D8—27



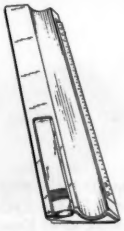
261,609
VISE
Pierre Roux, 43, Allee Du Mens, Villeurbane, France (69609)
Filed May 2, 1979, Ser. No. 35,400
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—74



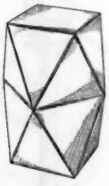
261,610
HAND IMPLEMENT
Robert W. Fee; Richard E. Ten Eyck, both of Wichita, and Lloyd T. Smith, Newton, all of Kans., assignors to S/V Tool Company, Inc., Newton, Kans.
Filed Oct. 18, 1979, Ser. No. 86,088
Term of patent 14 years
Int. Cl. D8—*04*
U.S. Cl. D8—82

261,611
LOAD BINDER RELEASE TOOL
Thomas L. Brannock, Rte. 9, Box 575-D, Avra Valley, Ariz. 85704
Filed Aug. 20, 1979, Ser. No. 67,833
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—89

261,612
COMBINED RULER AND LETTER OPENER
Walter Henkels, Holunderweg 1, 5142 Hückelhoven, Fed. Rep. of Germany
Filed Aug. 13, 1979, Ser. No. 65,971
Claims priority, application Fed. Rep. of Germany, Mar. 2, 1979, MR 121
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—104



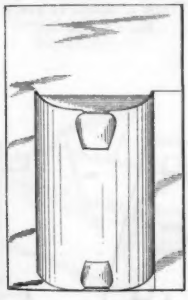
261,613
BOTTLED ALCOHOLIC BEVERAGE CARTON
Hampton E. Forbes, Jr., Wilmington, Del., assignor to Westvaco Corporation, New York, N.Y.
Filed Jun. 20, 1978, Ser. No. 917,299
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—418



261,614
PLAYING CARD BOX
Gregory J. Vallone, 9950 Delco, Chatsworth, Calif. 91311
Filed Aug. 30, 1979, Ser. No. 70,963
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—311

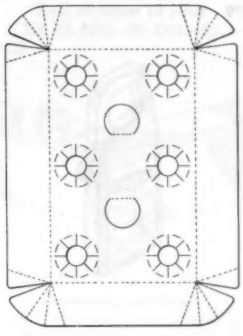
261,615
PERFUME BOTTLE
Albert Kaufmann, Geneva, Switzerland, assignor to Interdica S.A., Villars-sur-Glane, Switzerland
Filed Mar. 19, 1979, Ser. No. 22,076
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—337

261,616
COMBINED DISPLAY AND PACKAGING CONTAINER
Robert J. Tesar, and Robert E. Gannon, both of Pineville, N.C., assignors to Rexham Corporation, Pineville, N.C.
Filed Sep. 10, 1979, Ser. No. 73,619
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—415



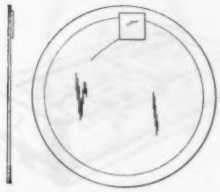
261,617
CARTON
John J. Austin,, Jr., Hinsdale, Ill., assignor to Champion International Corporation, Stamford, Conn.
Filed Feb. 1, 1979, Ser. No. 8,800
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—432

261,618
ARTICLE CARRIER BLANK
James R. Oliff, Austell, and Richard K. Watkins, Lithonia, both of Ga., assignors to The Mead Corporation, Dayton, Ohio
Filed Apr. 9, 1979, Ser. No. 28,540
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—433

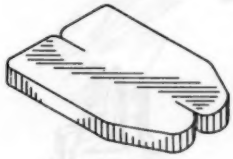


261,619
COMBINED BOTTLE CAP AND CAPSULE PIERCING DEVICE
Florence Borkan, South Orange, N.J., assignor to Pharmacaps, Inc., Elizabeth, N.J.
Division of Ser. No. 808,885, Jun. 22, 1977. This application Dec. 17, 1979, Ser. No. 104,378
Term of patent 14 years
Int. Cl. D09—*07*
U.S. Cl. D9—437

261,620
CONTAINER COVER
Raymond G. Scott, Oak Brook, and Lawrence S. Wysocki, Chicago, both of Ill., assignors to Champion International Corporation, Stamford, Conn.
Filed Dec. 21, 1978, Ser. No. 971,951
Term of patent 14 years
Int. Cl. D09—*99*
U.S. Cl. D9—438

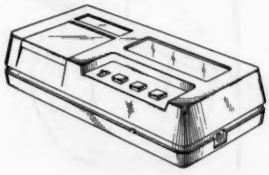


261,621
SUTURE PACKAGING ELEMENT
Luther A. Hoffman, Sinking Spring, Pa., assignor to Sharpoint Inc., Mohnton, Pa.
Filed Sep. 13, 1979, Ser. No. 75,224
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—456

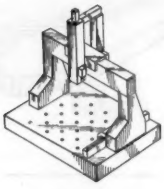


261,622
CLOCK
David A. Marquez, and Perfecto J. Marquez, both of 426 E. Main St., Stockton, Calif. 95202
Filed Nov. 23, 1979, Ser. No. 97,002
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—6

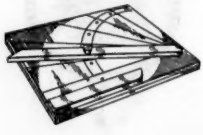
261,623
REFLECTANCE COLORIMETER
Kenneth D. Collister, Elkhart; Michael A. Krou, South Bend, and Raymond M. Werner, Elkhart, all of Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.
Filed Aug. 3, 1979, Ser. No. 63,198
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—46



261,624
THREE-DIMENSIONAL COORDINATE MEASURING INSTRUMENT
Katsuhito Fukano, and Yukio Mawake, both of Tochigi, Japan, assignors to Mitutoyo Mfg., Co., Ltd., Tokyo, Japan
Filed Nov. 6, 1979, Ser. No. 92,059
Claims priority, application Japan, May 10, 1979, 54-19052
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—46



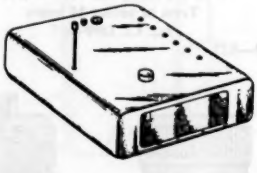
261,625
ANGLE CONVERTER
Robert J. Farino, R.D. #2, Box 152, Barnesboro, Pa. 15714
Filed Dec. 7, 1979, Ser. No. 101,161
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—65



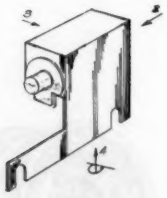
261,626
CORNER LEVEL
Robert H. VanderWerf, 1621 Livona La., P.O. Box 4333, Redding, Calif. 96001
Filed Oct. 24, 1979, Ser. No. 88,215
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—69

261,627
VOLT-OHM-AMMETER OR THE LIKE
Takeo Kuramoto, Tokyo, Japan, assignor to Kyoritsu Electrical Instruments Works, Ltd., Tokyo, Japan
Filed Sep. 10, 1979, Ser. No. 73,957
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—79

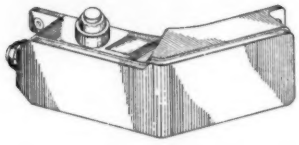
261,628
ALARM SYSTEM CONTROL UNIT
Daniel D. Schaeffer, 423A San Vincente Blvd., Santa Monica, Calif. 90402
Filed Aug. 16, 1978, Ser. No. 934,000
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106



261,629
EMERGENCY BRAKE WARNING DEVICE
Kevin L. Doheny, Tustin, Calif., assignor to Docan Corporation, Beverly Hills, Calif.
Filed Jun. 1, 1979, Ser. No. 44,597
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106



261,630
BELT MOUNTED REMOTE RADIO TRANSMITTER FOR SIGNALLING AN OPERATOR OF HEAVY EQUIPMENT
Bernd U. Luwe, Scarborough, Canada, assignor to Motorola, Inc., Schaumburg, Ill.
Filed Dec. 18, 1978, Ser. No. 970,422
Term of patent 14 years
Int. Cl. D10—*06*; D14—*03*
U.S. Cl. D10—121



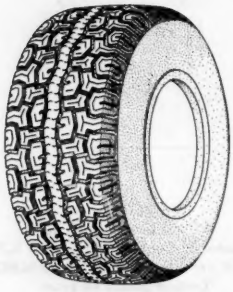
261,631
STATUETTE
David Immel, 4702 S. Ferdinand, Seattle, Wash. 98118
Filed Aug. 6, 1979, Ser. No. 63,913
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—131

261,632
BOWLING TROPHY
Gerald E. Karkanen, 1099 Monroe St., Shakopee, Minn. 55379
Filed Apr. 26, 1979, Ser. No. 34,161
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—157

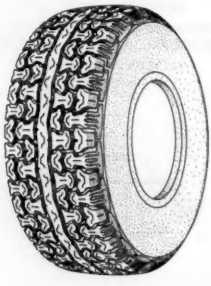
261,633
WINGED SCULPTURE
Stephen J. Gagliano, 35 Coral Ct., Malverne, N.Y. 11565
Filed Apr. 16, 1980, Ser. No. 140,952
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—162

261,634
ROOFING ROLL DISPENSER
Terry W. Beshears, 516 Yolo St., Bryte, Calif. 95605
Filed Jun. 25, 1979, Ser. No. 51,738
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D34—24

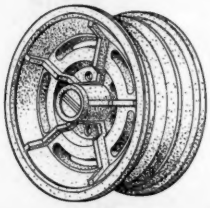
261,635
TIRE
Richard J. Skerl, Barberton, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio
Filed Nov. 27, 1978, Ser. No. 964,012
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—147



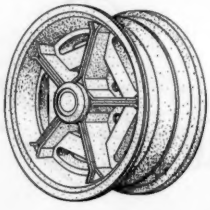
261,636
TIRE
Richard J. Skerl, Barberton, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio
Filed Feb. 4, 1980, Ser. No. 118,170
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—147



261,637
WHEEL
Russell O. Blanchard, Marshall; Joseph Guzek, Lansing, and Donald A. Matt, Bath, all of Mich., assignors to Motor Wheel Corporation, Lansing, Mich.
Filed Jan. 18, 1979, Ser. No. 4,315
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—209

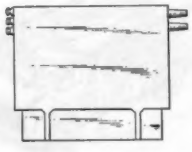


261,638
WHEEL
Russell O. Blanchard, Marshall; Joseph Guzek, Lansing, and Donald A. Matt, Bath, all of Mich., assignors to Motor Wheel Corporation, Lansing, Mich.
Filed Jan. 18, 1979, Ser. No. 4,349
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—209

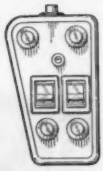


261,639
**WATER-DRIVEN ELECTRICITY GENERATOR**
Alan J. Robinson, 12 Trevi St., Jindalee, Queensland, 4074, Australia
Filed Jul. 13, 1979, Ser. No. 57,409
Claims priority, application Australia, May 31, 1979, 78007
Term of patent 14 years
Int. Cl. D13—*01*
U.S. Cl. D13—2

261,640
**COUPLING TRANSFORMER**
Friedrich Alber, Köngen; Gerhard Altmann, Kirchheim; Wolfgang Bendel, Leonberg; Rudolf Dedelmahr, Aich; Hermann Eyrich, Kirchheim; Rudolf Link, Bissingen, and Klaus Seeliger, Weilheim, all of Fed. Rep. of Germany, assignors to Transormatoren Union Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany
Filed Jun. 6, 1979, Ser. No. 46,059
Claims priority, application Fed. Rep. of Germany, Dec. 8, 1978, MR4971
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D13—*4*



261,641
**SWITCH OPERATED HAND SET FOR USE WITH TRAFFIC RADAR DEVICES OR THE LIKE**
William D. Uzzell, Neosho County, Kans., assignor to Kustom Electronics, Inc., Shawnee Mission, Kans.
Filed Jan. 26, 1979, Ser. No. 6,841
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—38



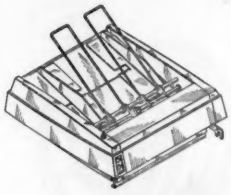
261,642
**LOUDSPEAKER**
Burton A. Babb, c/o Transrib Corp. 11562 Chairman Dr., Dallas, Tex. 75243
Filed Feb. 22, 1979, Ser. No. 14,064
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—30

261,643
**COMBINED CASSETTE RECORDER, RADIO AND TELEVISION**
Yasusuke Seki, and Takeshi Abe, both of Tokyo, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Dec. 5, 1979, Ser. No. 100,361
Claims priority, application Japan, Jun. 15, 1979, 54-24536
Term of patent 14 years
Int. Cl. D14—*018, 03*
U.S. Cl. D14—5

**261,644**
**MEMORY MODULE HOUSING**
**Kevin P. McKinsey, Scotts Valley, and James C. Asher, San Jose, both of Calif., assignors to Atari, Inc., Sunnyvale, Calif.**
**Filed Mar. 22, 1979, Ser. No. 22,572**
**Term of patent 14 years**
**Int. Cl. D14—*01;* D16—*99***
**U.S. Cl. D14—11**

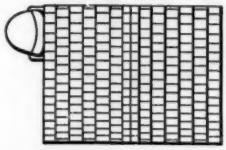
**261,645**
**LOUDSPEAKER**
**Burton A. Babb, c/o Transrib Corp. 11562 Chairman Dr., Dallas, Tex. 75243**
**Filed Feb. 22, 1979, Ser. No. 14,033**
**Term of patent 14 years**
**Int. Cl. D14—*01***
**U.S. Cl. D14—30**

**261,646**
**SHEET FEEDER**
**Loren D. Stirling, Pleasanton, Calif., assignor to Qume Corporation, San Jose, Calif.**
**Filed Apr. 18, 1978, Ser. No. 897,658**
**Term of patent 14 years**
**Int. Cl. D14—*02***
**U.S. Cl. D14—114**

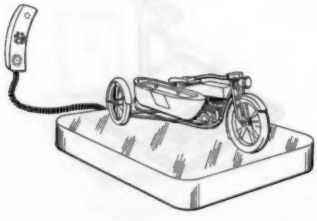


**261,647**
**TELEPHONE**
**Wesley L. Thomas, 109 S. Catalina St., Los Angeles, Calif. 90004**
**Filed May 7, 1979, Ser. No. 36,586**
**Term of patent 14 years**
**Int. Cl. D14—*03***
**U.S. Cl. D14—53**

261,648
TELEPHONE
Wesley L. Thomas, 109 S. Catalina St., Los Angeles, Calif. 90004
Filed May 18, 1979, Ser. No. 40,196
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—53



261,649
TELEPHONE
Wesley L. Thomas, 109 S. Catalina St., Los Angeles, Calif. 90004
Filed Jul. 13, 1979, Ser. No. 57,276
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—53

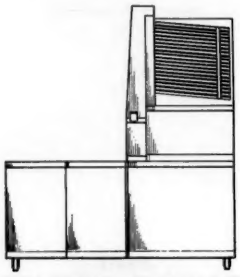


261,650
CLOCK RADIO RECEIVER
Peter H. J. van de Ven, Valkenswaard, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Aug. 30, 1979, Ser. No. 71,219
Claims priority, application United Kingdom, Mar. 8, 1979, 988.924/79
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—70

261,651
CLOCK RADIO OR SIMILAR ARTICLE
John S. Kolwaite, DeWitt, N.Y., assignor to General Electric Company, New York, N.Y.
Filed Jul. 25, 1979, Ser. No. 60,809
Term of patent 14 years
Int. Cl. D14—*03*; D10—*01*
U.S. Cl. D14—73

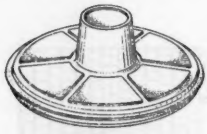
261,652
POWER CONSOLE
Robert L. Deschamps, Wheaton, Ill., assignor to Shure Brothers, Inc., Evanston, Ill.
Filed Aug. 17, 1979, Ser. No. 67,523
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—96

261,653
SORTING APPARATUS
Frederick J. Lawrence, Tustin, Calif., assignor to Nashua Corporation, Nashua, N.H.
Filed Sep. 18, 1978, Ser. No. 944,330
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—110

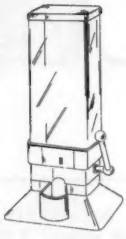


261,654
MOUNTING STAND FOR ATTACHING AN ACCESSORY TO AN ENGINE
James J. Feuling, 686 Ash Ave., Chula Vista, Calif. 92010
Filed Nov. 9, 1978, Ser. No. 959,433
Term of patent 14 years
Int. Cl. D15—*01*
U.S. Cl. D15—5

261,655
HEAD FOR A SWIMMING POOL CLEANER
Andrew L. Pansini, 200 Golden Gate Ave., Belvedere, Calif. 94920
Filed Nov. 23, 1979, Ser. No. 96,627
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D32—32

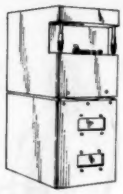


261,656
DISPENSER FOR LOZENGES
Thure Svensson, Habo, and Jan Brandstrom, Degeberga, both of Sweden, assignors to Aktiebolaget Cloetta, Ljungsbro, Sweden
Filed Oct. 15, 1979, Ser. No. 84,659
Claims priority, application Sweden, Apr. 20, 1979, 791013
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—111

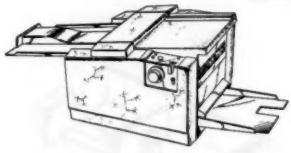


261,657
GLASS FILLER
Joseph N. Villa, Freehold, N.J., assignor to Standard-Keil Hardware Manufacturing Co., Del.
Filed Jan. 17, 1980, Ser. No. 112,889
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D15—118

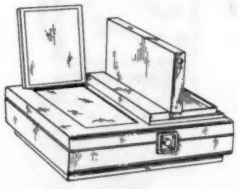
261,658
GARBAGE COMPACTOR
Hans Bachmann, Rigiweg 22, 4800 Zofingen, Switzerland
Filed Jul. 6, 1979, Ser. No. 55,421
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—123



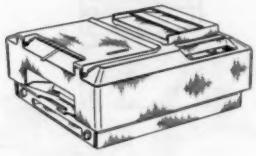
261,659
ELECTROPHOTOGRAPHIC COPIER
Michio Imada, Tokyo Kodaira, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan
Filed Feb. 7, 1979, Ser. No. 10,078
Claims priority, application Japan, Sep. 18, 1978, 53-39559
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—31



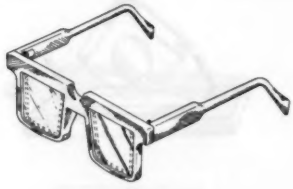
261,660
PHOTOPRINTING MACHINE
Jess Forrest, Bedford, and Carl D. Hardy, Medfield, both of Mass., assignors to Coulter Systems Corporation, Bedford, Mass.
Filed Aug. 10, 1979, Ser. No. 65,718
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—31



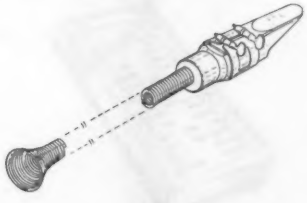
261,661
COPYING MACHINE
Terrence D. Charland, Pittsford; Dean R. Newcomb, Macedon, and Donald A. Robertson, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Sep. 13, 1979, Ser. No. 75,388
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—31



261,662
EYEGLASSES
Bernice Bedwell, Rte. 2, Box 321H, Midlothian, Tex. 76065
Filed Apr. 28, 1980, Ser. No. 144,239
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—104

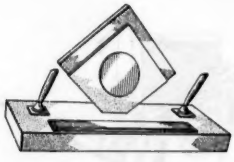


261,663
WIND INSTRUMENT
Frank H. Lawson, 1608 Trona Way, San Jose, Calif. 95125
Filed Mar. 24, 1980, Ser. No. 132,853
Term of patent 14 years
Int. Cl. D17—*02*
U.S. Cl. D17—10



261,664
COIN SEPARATOR ASSEMBLY
Rex M. Maloy, Broken Arrow, Okla., assignor to Orin W. Coburn, Muskogee, Okla.
Filed Jul. 7, 1980, Ser. No. 166,531
Term of patent 14 years
Int. Cl. D20—*99*
U.S. Cl. D18—3

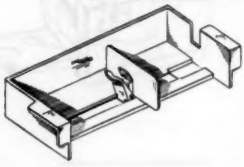
261,665
DESK PEN SET HOLDER
Elsa L. Delgado, 187 NW. 51 Ave., Miami, Fla. 33126, and Julia M. Pinera, 260 SW. 10 St., #3, Miami, Fla. 33130
Filed Nov. 13, 1978, Ser. No. 960,288
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—77



261,666
BACKGAMMON CALCULATOR
Andrei Sorin, Ste. 1107, 7 St. Denis Dr., North York (Don Mills), Ontario, Canada (M5C 1E5)
Filed Jul. 3, 1979, Ser. No. 54,586
Claims priority, application Canada, Mar. 14, 1979, 1403794
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—13

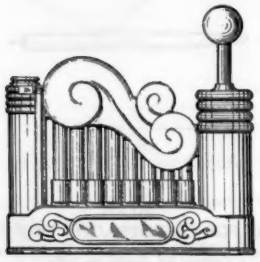
261,667
HOCKEY TARGET
Denis O. Griggs, 102 Spire Hillway, Willowdale, Ontario, Canada (M2H 3A6)
Filed Feb. 15, 1979, Ser. No. 12,541
Claims priority, application Canada, Aug. 15, 1978, 1508781
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—6

261,668
COMBINED HOLDER AND TRANSFER TRAY FOR BANK CHECKS
Elmer E. Ogg, Jr., and George F. Brun, Jr., both of Dayton, Ohio, assignors to New Balance Unlimited, Dayton, Ohio
Filed Feb. 13, 1980, Ser. No. 121,279
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—92



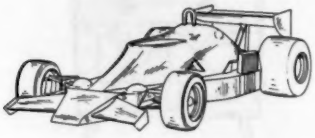
261,669
ELECTRONIC GAME HOUSING OR SIMILAR ARTICLE
Luan G. Tran, Redondo Beach, and Edward Mayer, Los Angeles, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed Jan. 21, 1980, Ser. No. 113,949
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—13

261,670
TOY CALLIOPE OR SIMILAR ARTICLE
John M. Melzian, Palos Verdes Estates; Aaron G. Cohen, Los Angeles, and Mike Nuttall, South Pasadena, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed Mar. 5, 1979, Ser. No. 17,225
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—64



261,671
TOY PLAY CASE OR SIMILAR ARTICLE
James R. Livesey, Fountain Valley, Calif., assignor to Mattel, Inc., Hawthorne, Calif.
Filed May 21, 1979, Ser. No. 17,223
Term of patent 14 years
Int. Cl. D3—*01*; D21—*01*
U.S. Cl. D21—109

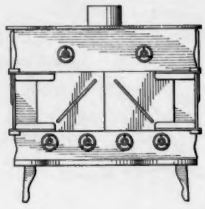
261,672
MODEL RACING CAR
Maurice P. Phillippe, Woking, England, assignor to Tyrrell Racing Organisation Limited, Surrey, England
Filed May 16, 1978, Ser. No. 906,765
Claims priority, application United Kingdom, Nov. 16, 1977, 982294/77
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—137



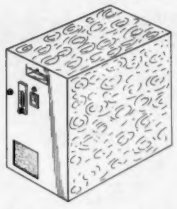
261,673
FISHING LURE
George S. Perrin, Fort Smith, Ark., assignor to Plastic Research & Development Corp., Fort Smith, Ark.
Filed Apr. 1, 1980, Ser. No. 136,282
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27

261,674
EXTENSION FOR GASOLINE DISPENSING NOZZLE
Gerald W. Nice, P.O. Box 57, Annabella, Utah 84711
Filed May 7, 1979, Ser. No. 36,599
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—37

261,675
SPACE HEATING STOVE
John H. Bane, III, 403 N. Maple Ave., Brunswick, Md. 21716
Continuation of Ser. No. 956,079, Oct. 30, 1978. This application Jul. 25, 1980, Ser. No. 172,479
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97

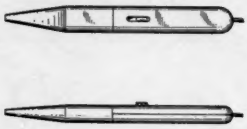


261,676
COMPACT OXYGEN CONCENTRATOR
Norman R. McCombs, Tonawanda, N.Y., assignor to Greene & Kellogg, Inc., Tonawanda, N.Y.
Filed May 14, 1979, Ser. No. 38,956
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—8

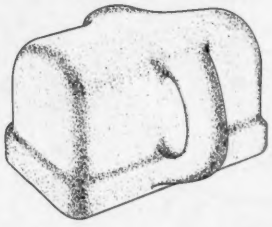


261,677
EVACUATOR TIP
Michael J. Neeley, 3065 Josey La., Ste. 6, Carrollton, Tex. 75006
Filed Jan. 8, 1979, Ser. No. 1,773
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—10

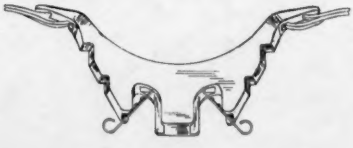
261,678
ELECTROLYSIS HAIR REMOVAL APPARATUS
Samuel J. Mann, Englewood, N.J., assignor to Inverness International, Englewood, N.J.
Filed Aug. 30, 1979, Ser. No. 70,768
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—26



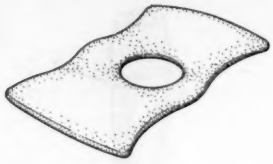
261,679
CASE FOR CHIROPRACTIC VIBRATOR
Edward D. Noble, 29 Havenbrook Blvd., Willowdale, Ontario, Canada (M2J 1A3)
Filed Oct. 20, 1978, Ser. No. 962,449
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D24—41



261,680
NASO-GASTRIC TUBE STABILIZER
Richard W. Hall, New Canaan, Conn., assignor to Technalytics, Inc., N.J.
Filed May 23, 1980, Ser. No. 152,686
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—53



261,681
ORTHOPEDIC PILLOW
John W. Chandler, 3121 E. 25th St., Minneapolis, Minn. 55406
Filed Jun. 7, 1979, Ser. No. 46,471
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—64



261,682
DENSITY MEASUREMENT ENCLOSURE FOR THE HUMAN BODY
Sidney H. Hoover, Woodside, Calif., assignor to Honex Corporation, Woodside, Calif.
Filed Sep. 13, 1979, Ser. No. 75,128
Term of patent 14 years
Int. Cl. D25—*04*
U.S. Cl. D25—16

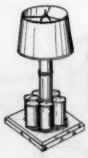
261,683
LINEAR MULTILAMP PHOTOFLASH UNIT
Emery G. Audesse, Beverly, Mass., and Donald W. Hartman, Williamsport, Pa., assignors to GTE Products Corporation, Stamford, Conn.
Filed Sep. 4, 1979, Ser. No. 72,400
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D26—2

261,684
UTILITY LIGHT
Duane E. Westover, 113 E. Rhondda, Lot 18, Andover, Kans. 67002
Filed Jun. 18, 1979, Ser. No. 49,951
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—63

261,685
WALL LAMP
Donald A. Kvasnicka, 718 N. Logan, Colorado Springs, Colo. 80909
Filed Apr. 18, 1979, Ser. No. 31,123
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—87

261,686
TABLE LAMP
Donald A. Kvasnicka, 718 N. Logan, Colorado Springs, Colo. 80909
Filed Apr. 18, 1979, Ser. No. 31,121
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—93

261,687
TABLE LAMP
Donald A. Kvasnicka, 718 N. Logan, Colorado Springs, Colo. 80909
Filed Apr. 18, 1979, Ser. No. 31,124
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—93

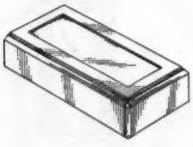


261,688
FLOOR LAMP
Donald A. Kvasnicka, 718 N. Logan, Colorado Springs, Colo. 80909
Filed Apr. 18, 1979, Ser. No. 31,117
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—102

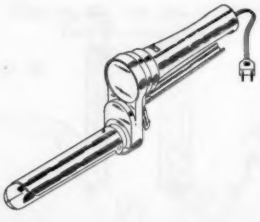
261,689
COMBINED PIPE AND STAND THEREFOR
Stephen Weglein, Los Angeles, Calif., assignor to Toke International, Inc., Marina Del Rey, Calif.
Filed Apr. 11, 1979, Ser. No. 29,701
Term of patent 7 years
Int. Cl. D27—*02*
U.S. Cl. D27—3

261,690
SMOKING PIPE
Joseph E. Murray, Jr., 27 Alpine St., #14, Malden, Mass. 02148
Filed May 14, 1979, Ser. No. 38,463
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D27—3

261,691
SOAP OR DETERGENT TABLET
Anthony S. Abraham, Stanmore, England, assignor to Lever Brothers Company, New York, N.Y.
Filed Sep. 5, 1979, Ser. No. 72,853
Claims priority, application United Kingdom, Mar. 7, 1979, 988895/79
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—8.1



261,692
CURLING IRON
Josephine A. O'Brien, 147 S. 5th St., St. Charles, Mo. 63301
Filed Jan. 29, 1980, Ser. No. 116,483
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—35



261,693

**COMBINED BRUSH AND MIRROR**

John deHaseth, Whittier, Calif., assignor to Jonee, Inc., Santa Fe Springs, Calif.

Filed Jul. 23, 1979, Ser. No. 59,603
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261,694

**CURTAIN MATERIAL**

Hans Stöcker, Wil, Switzerland, assignor to Gardisette International AG, Luzerne, Switzerland

Filed Jan. 9, 1980, Ser. No. 110,757
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1979, 752
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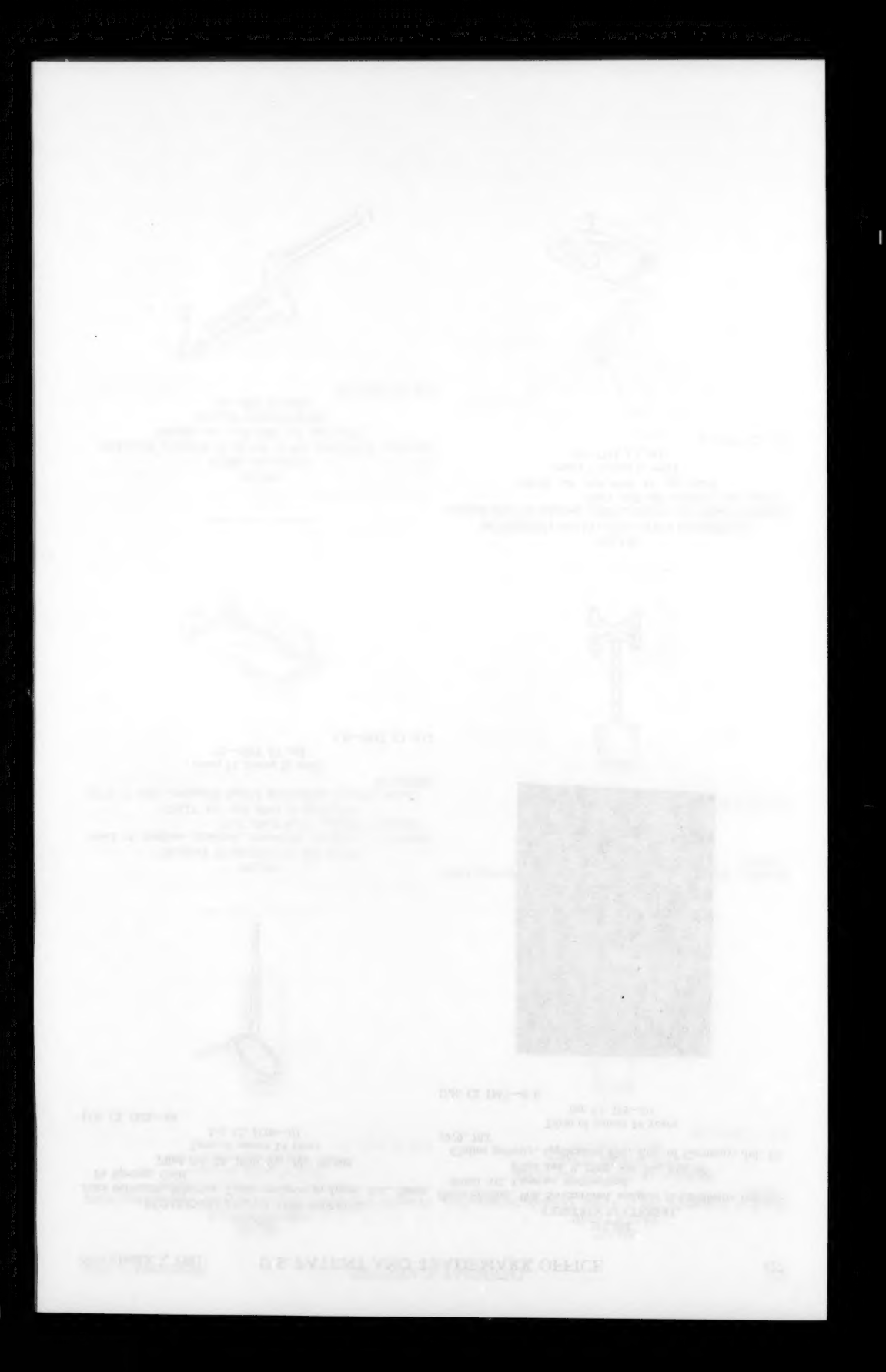
Int. Cl. D5—*05*
U.S. Cl. D47—6 E



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Bailey, Alan C.; and Morrow, Alan J., to Corning Glass Works. Method of making a soot preform compositional profile. 4,298,365, Cl. 65-3.120.
Baker, Charles L., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Method and apparatus for improving error rate on radio teletype circuits. 4,298,984, Cl. 375-40.000.
Baker, Gordon P.; and Warman, Thomas E., to Senco Products, Inc. Control arrangement for electro-mechanical tool. 4,298,072, Cl. 173-13.000.
Baker, Thomas N.: *See*—
Hansel, Sydney; and Baker, Thomas N., 4,298,044, Cl. 144-176.000.
Balch, Duane C. Locking fluid valve. 4,298,182, Cl. 251-251.000.
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Batalin, Oleg E.; Dykman, Arkady S.; Osadchenko, Alexandr I.; Balkhanova, Galina F.; Belgorodsky, Izrail M.; Nevstruev, Vladimir I.; Radionov, Valery A.; Tulchinsky, Eduard A.; Belyaev, Valentin M.; Smolin, Jury I.; Breiman, Mark I.; Orlyansky, Vitaly V.; Zhirnov, Nikolai Y.; Galibin, Nikolai V.; Troitsky, Adrian P.; and Kovalenko, Vladimir V., 4,298,503, Cl. 252-432.000.
Ballard, Arthur H.; and Klein, Theodore J., to United States of America, Army. Digital filter bank detector. 4,298,985, Cl. 375-82.000.
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Ledford, Charles D., 4,298,435, Cl. 201-8.000.
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Thyret, Helmut; Balwe, Thomas; Hanzalik, Josef; Furst, Herbert; and Bauer, Johann, 4,298,576, Cl. 422-135.000.
Baney, Ronald H.; and Gaul, John H., Jr., to Dow Corning Corporation. High yield silicon carbide pre-ceramic polymers. 4,298,558, Cl. 264-65.000.
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Banta, Frederick; Milstein, Donald; and Peters, Alan W., to Mobil Oil Corporation. Low pressure hydrotreating of residual fractions. 4,298,458, Cl. 208-112.000.
Barbakadze, Dzhondo F.; Mindeli, Mamuka S.; Macharashvili, Petr G.; Rusidze, Vazha V.; and Suladze, Otari N. Method of introducing powdered reagents into molten metals and apparatus for effecting same. 4,298,192, Cl. 266-218.000.
Barmag Barmer Maschinenfabrik Aktiengesellschaft: *See*—
Bauer, Karl; and Krenzer, Eberhard, 4,297,837, Cl. 57-350.000.
Barnes, Johnny G.; Hurley, Patrick J.; and Miller, Gary W., to International Business Machines Corporation. System and printer justification system. 4,298,290, Cl. 400-3.000.
Barradas, George, to Appliance Design Probe Inc. Apparatus for heating and setting hair. 4,298,787, Cl. 219-222.000.
Barrow, Ralph M., Jr.: *See*—
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Barton, Derek H. R.; Bronstein-Bonte, Irena Y.; and Taylor, Lloyd D., to Polaroid Corporation. Optical filter agents and photographic products and processes containing same. 4,298,676, Cl. 430-221.000.
Baryshnikova, Svetlana M.: *See*—
Bochkarev, Ellin P.; Prokopov, Igor V.; Eljutin, Alexandr V.; Belsky, Arkady A.; Baryshnikova, Svetlana M.; Nasyrov, Nail Z.; Novikov, Nikolai A.; Khairulin, Edige R.; Zvyagin, Mikhail S.; Abrjutin, Vladimir N.; Konstantinova, Ljubov I.; Ljubimova, Nina A.; and Gorbacheva, Nadezhda S., 4,298,380, Cl. 75-101.0BE.
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Distler, Dieter; Mueller, Margarete; Bubam, Hans-Georg; and Addicks, Guenther, 4,298,513, Cl. 260-29.70H.
Dockner, Toni; Kempe, Uwe; Krug, Herbert; Magnussen, Peter; Praetorius, Werner; and Szymanski, Hans J., 4,298,748, Cl. 548-347.000.
Engelbach, Heinz; Krabetz, Richard; Duembgen, Gerd; Willersinn, Carl-Heinz; and Beitelschmidt, Walter, 4,298,763, Cl. 568-479.000.
Goetz, Norbert; Himmele, Walter; and Hupfer, Leopold, 4,298,733, Cl. 544-106.000.
Hahn, Klaus; Hinselmann, Klaus; Halbritter, Klaus; Rebafka, Walter; and Weber, Heinz, 4,298,702, Cl. 521-79.000.
Hamprecht, Gerhard; Stubenrauch, Gerd; Urbach, Hans; and Wuerzer, Bruno, 4,298,731, Cl. 544-11.000.
Hoch, Helmut; Hahn, Erwin; and Hiller, Heinrich, 4,298,534, Cl. 260-358.000.
Lechtken, Peter; Buethe, Ingolf; Jacobi, Manfred; and Trimborn, Werner, 4,298,738, Cl. 546-22.000.
Plath, Peter; Rohr, Wolfgang; Wuerzer, Bruno; and Becker, Rainer, 4,298,749, Cl. 548-377.000.
Sappok, Reinhard; Guellich, Fritz; Roth, Karl; and Wiesenberger, Alois, 4,298,526, Cl. 260-314.500.
Schwarz, Gerd-Ulrich; Kiehs, Karl; Boell, Walter; and Adolphi, Heinrich, 4,298,615, Cl. 424-285.000.
Staab, Heinz; and Ippen, Joachim, 4,298,751, Cl. 549-11.000.
Bashaw, Robert W. Cervical immobilizer. 4,297,994, Cl. 128-133.000.
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Batalin, Oleg E.; Dykman, Arkady S.; Osadchenko, Alexandr I.; Balkhanova, Galina F.; Belgorodsky, Izrail M.; Nevstruev, Vladimir I.; Radionov, Valery A.; Tulchinsky, Eduard A.; Belyaev, Valentin M.; Smolin, Jury I.; Breiman, Mark I.; Orlyansky, Vitaly V.; Zhirnov, Nikolai Y.; Galibin, Nikolai V.; Troitsky, Adrian P.; and Kovalenko, Vladimir V. Method of preparing calcium boron phosphate catalyst. 4,298,503, Cl. 252-432.000.
Bath, Nigel A.: *See*—
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Baucom, Charlie J. Curb forming apparatus. 4,298,293, Cl. 404-98.000.
Bauer, Erwin; Davids, Ralf; Gotz, Gerhard; Jussen, Hilmar; Arndt, Heinrich; Kummel, Louis; Morhart, Rudolf; and Pollak-Banda, Erich, to Werner & Pfleiderer; and Zahnraderfabrik Renk Aktiengesellschaft. Power distribution gearing for double helix extruders. 4,297,917, Cl. 74-665.00G.
Bauer, Hans F., to Occidental Research Corporation. Method of embrittling waste. 4,298,350, Cl. 44-1.00C.
Bauer, Jack N.: *See*—
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DiGiulio, Adolph V.; and Bauer, Jack N., 4,298,704, Cl. 521-88.000.
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Thyret, Helmut; Balwe, Thomas; Hanzalik, Josef; Furst, Herbert; and Bauer, Johann, 4,298,576, Cl. 422-135.000.
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Baur, Karl G.: *See*—
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Baxter Travenol Laboratories, Inc.: *See*—
Pernic, Stanley J., 4,298,357, Cl. 55-165.000.
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Knopf, Herbert; Spahrkas, Heinrich; and Luck, Wolfhard, 4,298,344, Cl. 8-94.260.
Lewalter, Jurgen; Rottmaier, Ludwig; Merten, Rudolf; Zecher, Wilfried; Dunwald, Willi; and Schulte, Bernhard, 4,298,515, Cl. 260-30.40N.

Meyborg, Holger; and Weber, Christian, 4,298,701, Cl. 521-51.000.

BBC Brown, Boveri & Company Limited: *See—*
Fried, Reinhard; Mayer, Andreas; and Perego, Ambrogio, 4,298,028, Cl. 137-868.000.
Gloor, Ernst; Kaufmann, Meinolph; and Kmetz, Allan R., 4,298,249, Cl. 350-338.000.
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Beach, Ronald I.: *See—*
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Beacom, Keith I. Mooring device. 4,297,963, Cl. 114-230.000.

Beaird-Poulan Division: *See—*
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Becker, Manfred; Slabik, Angela; Mucke, Bruno; Moisar, Erik; and von Rintelen, Harald, to AGFA-Gevaert Aktiengesellschaft. Light-sensitive photographic material. 4,298,683, Cl. 430-569.000.

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Beecham Group Limited: *See—*
Wootton, Gordon; and Moore, Richard W., 4,298,745, Cl. 548-313.000.

Beier, Hanns W. Key holder. 4,297,864, Cl. 70-456.00B.

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Bel Fuse, Inc.: *See—*
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Batalin, Oleg E.; Dykman, Arkady S.; Osadchenko, Alexandr I.; Balkhanova, Galina F.; Belgorodsky, Izrail M.; Nevstruev, Vladimir I.; Radionov, Valery A.; Tulchinsky, Eduard A.; Belyaev, Valentin M.; Smolin, Jury I.; Breiman, Mark I.; Orlyansky, Vitaly V.; Zhirnov, Nikolai Y.; Galibin, Nikolai V.; Troitsky, Adrian P.; and Kovalenko, Vladimir V., 4,298,503, Cl. 252-432.000.

Bell & Howell Company: *See—*
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Bell Telephone Laboratories, Incorporated: *See—*
Abbott, Robert P.; Chow, Ming-Chwan; Cirillo, Anthony J.; Drechsler, Rudolph C.; and Horney, Lee F., II, 4,298,977, Cl. 370-62.000.
Boyd, Gary D.; Mohapatra, Sarat K.; Tell, Benjamin; Wagner, Sigurd; and Wudl, Fred, 4,298,250, Cl. 350-357.000.
Casey, Horace C., Jr.; Cho, Alfred Y.; and Foy, Philip W., 4,297,783, Cl. 29-578.000.
Griffith, Gary L.; and Sherman, Charles J., 4,298,237, Cl. 339-17.00L.
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Montalto, Anthony R.; Scerbo, Louis J.; and Starace, Jeremia P., 4,298,239, Cl. 339-66.00M.

Bellis, Andrew G., to Ford Motor Company. Motor vehicle carburetor choke mechanism. 4,297,980, Cl. 123-438.000.

Beloit Corporation: *See—*
Hergert, Richard E.; and Bergstrom, Jan I., 4,298,429, Cl. 162-343.000.

Belsky, Arkady A.: *See—*
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Benditalia S.p.A.: *See—*
Cadeddu, Leonardo, 4,297,846, Cl. 60-585.000.

Benjamin, Milton L.; and Miles, Wilbur N., to Erickson Tool Company. Spring actuated chuck. 4,298,208, Cl. 279-91.000.

Benson, Clark K.; Caridis, Andrew A.; and Nilsen, Arthur A., to Heat and Control, Inc. Method and apparatus for flavoring and surface treatment of meat products. 4,297,942, Cl. 99-386.000.

Bentvelzen, Jozef M.; Meredith, Michael D.; Torregrossa, Louis O.; and Bepple, Henry, to Weyerhaeuser Company. Method and apparatus for intimately mixing oxygen and pulp while using an alkali to extract bleaching by-products. 4,298,427, Cl. 162-57.000.

Bentvelzen, Jozef M.: *See—*
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Berenblut, Brian J.: *See—*
Munday, George; Slater, David H.; Tyley, Leonard R. T.; Berenblut, Brian J.; and Whitehouse, Harry B., 4,298,955, Cl. 364-900.000.

Beresford-Jones, Godric P. K. Waterproof seal for a push-button. 4,298,778, Cl. 200-302.000.

Berger, Eugene L., to General Electric Company. Downhole pressure measurements of drilling mud. 4,297,880, Cl. 73-155.000.

Berghahn, Walter G.; and Weinstein, Jack, to Bristol-Myers Company. Dial type child resistant dispenser. 4,298,125, Cl. 206-531.000.

Berglund, Erling, to LKB Clinicon Aktiebolag. Pipetting and dosing device. 4,298,575, Cl. 73-864.130.

Berglund, Neil C.; Kempke, William G.; and Richardson, William C., to International Business Machines Corporation. Computer instruction prefetch circuit. 4,298,927, Cl. 364-200.000.

Bergman, Raymond A. Air float power rotation system. 4,298,307, Cl. 414-676.000.

Bergstrom, Jan I.: *See—*
Hergert, Richard E.; and Bergstrom, Jan I., 4,298,429, Cl. 162-343.000.

Berkowitz, Sidney, to FMC Corporation. Preparation of alkyl glyceryl ether alcohols. 4,298,764, Cl. 568-618.000.

Berlongieri, John J. Aircraft safety apparatus. 4,298,177, Cl. 244-139.000.

Bernard, Claude R.; Daigne, Bernard; and Girard, Francois, to Office National d'Etudes et de Recherches Aerospaticles. Spectrograph usable in particular in the far ultraviolet. 4,298,797, Cl. 250-372.000.

Bernstein, Elliot, to Bel Fuse, Inc. Splicer fuse integrated in line cord plug. 4,298,241, Cl. 339-147.00P.

Berol Kemi AB: *See—*
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Berthier, Marc A.; and Chauvel, Alain Y. Folding chair. 4,298,227, Cl. 297-58.000.

Bertolacini, Ralph J.: *See—*
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Beth GmbH: *See—*
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Biddle, Richard A.; Vriesen, Calvin W.; and Sutton, Ernest S., to Thiokol Corporation. Gas generator composition for producing cool effluent gases with reduced hydrogen cyanide content. 4,298,412, Cl. 149-19.500.

Bielska-Lewandowska, Halina; Irisova, Natalija; Jung, Grzegorz; Lewandowski, Stanislaw J.; Prohorov, Aleksandr; Sobolewski, Roman; and Vinogradov, Eugenij, to Polska Akademia Nauk Instytut Fizyki. Frequency converter of electromagnetic radiation in millimeter and submillimeter wavelength range. 4,298,990, Cl. 455-325.000.

Bigelow, George A.; Rehage, Ted A.; and Shook, Frankie S., to International Business Machines Corporation. Alternating data buffers when one buffer is empty and another buffer is variably full of data. 4,298,954, Cl. 364-900.000.

Bilek, F. Thomas: *See—*
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Bingham, Robert M.: *See—*
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Biphase Energy Systems: *See—*
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Birch, Stanley F.; Lawler, John A.; and Paynter, Gerald C., to Boeing Company, The. Vortex generators for internal mixing in a turbofan engine. 4,298,089, Cl. 181-213.000.

Bischoff, Jurgen H.; and Sebulke, Joachim A., to Shell Internationale Research Maatschappij B.V. Plural electrode method and means for water bottom logging. 4,298,840, Cl. 324-365.000.

Bishop, John F., to Eastman Kodak Company. Photographic element having overcoating of ionic polyester in hydrophilic colloid. 4,298,682, Cl. 430-533.000.

Bizerba-Werke Wilhelm Kraut KG: *See—*
Kuhnle, Ernst; and Schwarz, Josef, 4,297,875, Cl. 73-862.620.
Black & Decker Inc.: *See—*
Jackson, Ronald A.; and Maruscak, John, 4,298,095, Cl. 182-184.000.
Jinkins, Danny R., 4,298,204, Cl. 277-165.000.
Pioch, Peter P., 4,297,831, Cl. 56-295.000.
Black, James M., to United States of America, National Aeronautics and Space Administration. Power converter. 4,298,926, Cl. 363-132.000.
Blaney, Peter G.; Conley, Dwain D.; and Zeigner, Willard L., to Zemco, Inc. Fluid flow sensor. 4,297,899, Cl. 73-861.580.
Blasberg, Helmar; and Wilkens, Christian, to Karl Mayer Textilmaschinenfabrik GmbH. High density pile ware and the process therefor. 4,297,858, Cl. 66-194.000.
Blaszyk, Paul E.; and Murphy, Susan F., to Corning Glass Works. Method of making optical fibers having improved core roundness. 4,298,364, Cl. 65-3.110.
Blessing, James E.: *See—*
Ross, David S.; and Blessing, James E., 4,298,450, Cl. 208-8.0LE.
Blodgett, Stewart B. Differential weighing system providing improved signal to noise ratio. 4,298,081, Cl. 177-187.000.
Blotenberg, Wilfried, to Gutehoffnungshutte Sterkrade AG. Process and apparatus for prevention of surging in turbocompressors. 4,298,310, Cl. 415-1.000.
Bluhm, Eugene A.: *See—*
Funk, Larry J.; and Bluhm, Eugene A., 4,297,950, Cl. 104-172.0BT.
Blysing, Ake, to Berol Kemi AB. Diesel fuel comprising methanol and a methanol-soluble polyoxyalkylene compound. 4,298,352, Cl. 44-53.000.
Bobard, Emile, to Bobard Jeune, S.A., a part interest. Ballasting and inflation apparatus. 4,298,047, Cl. 152-417.000.
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Bochkarev, Ellin P.; Prokopov, Igor V.; Eljutin, Alexandr V.; Belsky, Arkady A.; Baryshnikova, Svetlana M.; Nasyrov, Nail Z.; Novikov, Nikolai A.; Khairulin, Edige R.; Zvyagin, Mikhail S.; Abrjutin, Vladimir N.; Konstantinova, Ljubov I.; Ljubimova, Nina A.; and Gorbacheva, Nadezhda S. Process for purifying low-melting metals from impurities. 4,298,380, Cl. 75-101.0BE.
Boehringer Mannheim GmbH: *See—*
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Boeing Company, The: *See—*
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Boesiger, Dwight D.: *See—*
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Boettcher, Bodo, to N.V. Raychem S.A. Heat recoverable article. 4,298,641, Cl. 428-36.000.
Bogoch, Samuel. Detection of malignant tumor cells. 4,298,590, Cl. 424-1.000.
Bohl, Thomas L., to Babcock & Wilcox Company, The. Hydrogen gas detector. 4,298,574, Cl. 422-97.000.
Bonamour du Tartre, Georges: *See—*
Germain, Alfred; and Bonamour du Tartre, Georges, 4,298,188, Cl. 266-114.000.
Bongers, Piet F.; van Tol, Maurits W.; and Robertson, John M., to U.S. Philips Corporation. Luminescent screen. 4,298,820, Cl. 313-463.000.
Borghi, Italo; Foschi, Sergio; and Galli, Paolo, to Montedison S.p.A. Thermoplastic rubbers and process for preparing same. 4,298,721, Cl. 526-348.000.
Bosler, Alan J.; and Nash, Larry E., to United States of America, Navy. Cooling apparatus for electronic modules. 4,298,905, Cl. 361-386.000.
Bossler, Robert B., Jr.; and Hardersen, Charles P., to Kaman Aerospace Corporation. Torque splitting gear drive. 4,297,907, Cl. 74-417.000.
Bouchard, Claude: *See—*
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Bouldin, Eric W.; and Drexler, Jerome, to Drexler Technology Corporation. Reflective data storage medium made by silver diffusion transfer in silver-halide emulsion incorporating nuclei. 4,298,684, Cl. 430-616.000.
Bouvier, Alfred J.: *See—*
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Boyama, Kimihiro, to Kokusan Denki Co., Ltd. Ignition system for an internal combustion engine. 4,297,977, Cl. 123-320.000.
Boyd, Gary D.; Mohapatra, Sarat K.; Tell, Benjamin; Wagner, Sigurd; and Wudl, Fred, to Bell Telephone Laboratories, Incorporated. Solid electrochromic devices. 4,298,250, Cl. 350-357.000.
Bozeman, Milton R. Winterizing apparatus for recreational vehicles, vacation homes and the like. 4,298,021, Cl. 137-334.000.
Bozzo, Gian M.; Gava, Paolo; and Paruzzolo, Antonio, to Tecnomare S.p.A. Composite flexible conduit for sucking large volumes of sea water from deep water bodies. 4,298,295, Cl. 405-52.000.
BPB Industries Limited: *See—*
Leeming, Peter A.; Mitakidis, Dimitrios; and Woodrow, Peter F., 4,298,394, Cl. 106-111.000.
Brachthauser, Kunibert; and Herchenbach, Horst, to Klockner-Humboldt-Deutz AG. Method and system for burning fine-grained material, particularly for the manufacture of cement clinkers. 4,298,393, Cl. 106-100.000.
Bradford, Larry L.; Jordan, David R.; and Williams, Kenneth W., to Dow Chemical Company, The. Method and apparatus for the preparation of foamed structures. 4,298,557, Cl. 264-51.000.
Bradlee, Charles R., to Monarch Machine Tool Company, The. Method and apparatus for tensioning metallic strips on a slitting line. 4,298,633, Cl. 427-172.000.
Bradley, Lindell P.: *See—*
Bradley, Robert F.; and Bradley, Lindell P., 4,298,115, Cl. 194-4.00F.
Bradley, Robert F.; and Bradley, Lindell P., to Micro-Circuits Company. Time-lapse indicator. 4,298,115, Cl. 194-4.00F.
Brand, Arnold J.: *See—*
Acker, Robert H.; Wessling, William C.; Brand, Arnold J.; and Naydan, Bob N., 4,298,832, Cl. 318-318.000.
Brandt Industries, Inc.: *See—*
Brandt, Robert O., Jr., 4,297,900, Cl. 73-861.660.
Brandt, Robert O., Jr., to Brandt Industries, Inc. Averaging pitot primary system. 4,297,900, Cl. 73-861.660.
Branick Mfg., Inc.: *See—*
Severson, Larry A., 4,298,420, Cl. 156-394.00R.
Branson, Charles R. Chirping flying saucer. 4,297,809, Cl. 46-74.00D.
Bray, Geddes A., to Mather & Platt Limited. Heat sensitive release devices. 4,298,068, Cl. 169-39.000.
Brehm, Michael: *See—*
Rutsch, Peter W.; and Brehm, Michael, 4,298,556, Cl. 264-46.600.
Breiman, Mark I.: *See—*
Batalin, Oleg E.; Dykman, Arkady S.; Osadchenko, Alexandr I.; Balkhanova, Galina F.; Belgorodsky, Izrail M.; Nevstruev, Vladimir I.; Radionov, Valery A.; Tulchinsky, Eduard A.; Belyaev, Valentin M.; Smolin, Jury I.; Breiman, Mark I.; Orlyansky, Vitaly V.; Zhirnov, Nikolai Y.; Galibin, Nikolai V.; Troitsky, Adrian P.; and Kovalenko, Vladimir V., 4,298,503, Cl. 252-432.000.
Breslin, Michael D.; and Cosper, David R., to Nalco Chemical Company. Use of additives in pulp bleaching processes to preserve pulp strength. 4,298,428, Cl. 162-73.000.
Brewing Patents Limited: *See—*
Laws, Derek R. J.; Bath, Nigel A.; Ennis, Colin S.; Pickett, John A.; and Wheldon, Alfred G., 4,298,626, Cl. 426-600.000.
Brimec (U.K.) Limited: *See—*
Jones, Anthony E., 4,298,304, Cl. 414-492.000.
Brinkmnn En Niemeyer N.V.: *See—*
Poiesz, Gerardus W., 4,297,974, Cl. 119-51.00R.
Bristol-Myers Company: *See—*
Berghahn, Walter G.; and Weinstein, Jack, 4,298,125, Cl. 206-531.000.
Bristow, Ian T.; and Petts, Nigel J., to Hobourn-Eaton Limited. Positive displacement pump systems. 4,298,315, Cl. 417-300.000.
Britch, James A., to Standard Oil Company (Indiana). Latching assembly for riser pipe spacers. 4,298,218, Cl. 285-3.000.
British Aerospace Public Limited Company: *See—*
Morton, Donald F., 4,297,904, Cl. 74-5.00F.
British Broadcasting Corporation: *See—*
Byford, Roger G., 4,298,981, Cl. 371-37.000.
British Cellophane Limited: *See—*
Hood, John L. L., 4,298,440, Cl. 204-165.000.
British Steel Corporation: *See—*
Brownlee, Malcolm; and Harrison, Thomas C., 4,298,406, Cl. 148-12.00B.
Hill, Walter J., 4,298,808, Cl. 250-563.000.
Brock, George W.: *See—*
Argumedo, Armando J.; Brock, George W.; and Losee, Paul D., 4,298,899, Cl. 360-122.000.
Broecker, Franz J.; Baur, Karl G.; Platz, Rolf; and Stabenow, Joachim, to BASF Aktiengesellschaft. Preparation of 2-methyl-pentane-2,4-diol. 4,298,766, Cl. 568-862.000.
Bronfman, Aron I.: *See—*
Avdeenko, Boris K.; Bronfman, Aron I.; Vitkin, Alexandr L.; Zelentsov, Boris N.; Kinevsky, Valery N.; and Rozet, Vladimir E., 4,298,900, Cl. 361-127.000.
Bronstein-Bonte, Irena Y.: *See—*
Barton, Derek H. R.; Bronstein-Bonte, Irena Y.; and Taylor, Lloyd D., 4,298,676, Cl. 430-221.000.
Brooks, Robert B., to General Electric Company. Refrigerator defrost control with control of time interval between defrost cycles. 4,297,852, Cl. 62-153.000.
Brown, Herbert C., to Aldrich-Boranes, Inc. Borane-1,4-thioxane. 4,298,750, Cl. 549-4.000.
Brown, Joseph P.: *See—*
Parkinson, Thomas M.; Brown, Joseph P.; and Wingard, Robert E., Jr., 4,298,595, Cl. 424-78.000.
Brown, Keith E.: *See—*
Prior, William C.; and Brown, Keith E., 4,298,025, Cl. 137-624.140.
Brown, Milton F., Jr. Vehicle safety restraint device. 4,298,214, Cl. 280-735.000.
Brown, Richard E.; St. Georgiev, Vasil; and Loev, Bernard, to USV Pharmaceutical Corporation. Esters of benzoxa(thia)zole-2-carboxylic acids. 4,298,742, Cl. 548-152.000.
Brownlee, Malcolm; and Harrison, Thomas C., to British Steel Corporation. Manufacture of steel products. 4,298,406, Cl. 148-12.00B.
Bruker, Jacques: *See—*
Lotteau, Jacques; Bruker, Jacques; and Freche, Charles, 4,298,210, Cl. 280-259.000.

Bruni, Ludovico; and Iguera, Pierantonio, to Associated Engineering, Italy, S.p.A. Piston and cylinder assemblies. 4,297,976, Cl. 123-193.0CP.

Bruno, Vogel, to N.V. APR Europe S.A. Method and apparatus for manufacturing seamless printing roll. 4,298,680, Cl. 430-300.000.

Bryant, Clyde C. Distress gas generating signal balloon apparatus. 4,298,777, Cl. 200-61.45R.

BSG-Schalttechnik GmbH & Co., K.G.: *See*—
Granholm, Carl; and Faudi, Rudi, 4,298,792, Cl. 235-375.000.

Bubam, Hans-Georg: *See*—
Distler, Dieter; Mueller, Margarete; Bubam, Hans-Georg; and Addicks, Guenther, 4,298,513, Cl. 260-29.70H.

Bucaro, Joseph A., to United States of America, Navy. High-sensitivity, low-noise, remote optical fiber. 4,297,887, Cl. 73-655.000.

Buchanan, Steven O.; and Phillips, James W., to Dwyer Instruments, Inc. Roll-up type U-tube manometer. 4,297,889, Cl. 73-747.000.

Buck, Norman R.; and Hanson, David J., to Vital Signs, Inc. Microprocessor controlled telephone set. 4,298,775, Cl. 179-81.00R.

Bueno, Alejandro G.: *See*—
Stover, K. Lawrence; Bueno, Alejandro G.; Miller, James W.; and Shamp, Donald E., 4,298,372, Cl. 65-136.000.

Buethe, Ingolf: *See*—
Lechtken, Peter; Buethe, Ingolf; Jacobi, Manfred; and Trimborn, Werner, 4,298,738, Cl. 546-22.000.

Buettner, Larry H. Toy game bank. 4,297,807, Cl. 46-4.000.

Buffet, Jean, to Air Industrie. Heat exchangers for thermo-electric installations comprising thermo-elements. 4,297,849, Cl. 62-3.000.

Bulloch, David K.; and Kim, Hong Z., to Philip A. Hunt Chemical Corp. N,N Disubstituted p-phenylenediamine phosphates to form a color developer working solution, a color developer concentrate containing such a phosphate and a method of using said working solution for color development of color film. 4,298,681, Cl. 430-466.000.

Bullock, Ralph; and Skibinski, Orland E. Earthen-covered structure and panel used therein. 4,297,817, Cl. 52-169.600.

Bunker Ramo Corporation: *See*—
Hall, Stanley R., 4,298,951, Cl. 364-752.000.

Burianek, Rudolf; and Tschannen, Gottfried, to Siemenas-Albis AG. Synchronization circuit for video clock oscillators. 4,298,889, Cl. 358-148.000.

Burkart, Alan R.: *See*—
Langdon, C. Ray; and Burkart, Alan R., 4,298,408, Cl. 148-32.000.

Burlington Industries, Inc.: *See*—
Lilly, James R., 4,297,836, Cl. 57-291.000.

Burns, Dallas D.: *See*—
Glass, Cecil A.; and Burns, Dallas D., 4,297,949, Cl. 102-229.000.

Burris, Michael V. Asphalt-sulfur emulsion composition. 4,298,397, Cl. 106-274.000.

Burroughs Corporation: *See*—
McElligott, Michael J.; and Tkalenko, Victor J., Jr., 4,298,216, Cl. 203-6.000.

Burroughs, Elvin O. Chain tightener attachment. 4,297,916, Cl. 74-544.000.

Burroughs Wellcome Co.: *See*—
Parikh, Indu; and Cuatrecasas, Pedro, 4,298,685, Cl. 435-7.000.
Snary, David, 4,298,596, Cl. 424-88.000.

Bursky, Phyllis L.: *See*—
Daniel, Chelliah; and Bursky, Phyllis L., 4,298,755, Cl. 560-214.000.

Bush, Steven C.; and Smathers, Robert E., to Product Dynamics, Ltd. Game. 4,298,199, Cl. 273-1.0GD.

Bushee, Lawrence C., to Amana Refrigeration, Inc. Heat exchange system. 4,297,987, Cl. 126-351.000.

Bushtedt, Jury P.: *See*—
Paton, Boris E.; Kudinov, Vladimir M.; Volgin, Leonid A.; Petushkov, Vladimir G.; Bushtedt, Jury P.; Koroteev, Anatoly Y.; and Kotov, Viktor A., 4,297,946, Cl. 102-307.000.

Busi, Giovanni. Apparatus for knitting terry loops on a circular hosiery machine. 4,297,857, Cl. 66-9.00R.

Butler, G. Theodore; Porter, Travis G.; and Fisher, Harold E., to Mechtron International Corporation. Fuel burner having flame stabilization by internal recirculation. 4,298,337, Cl. 431-285.000.

Butt, Alan G.; and Whitehead, Abe G., to Trane Company, The. Method for joining two plate type heat exchanger core sections with an intermodular layer for improved heat transfer. 4,297,775, Cl. 29-157.30R.

Butter, Stephen A.; Chester, Arthur W.; and Schwartz, Albert B., to Mobil Oil Corporation. Conversion of synthesis gas with iron-containing catalyst. 4,298,695, Cl. 518-720.000.

Buzza, Edmund E., to Beckman Instruments, Inc. Liquid transfer valve. 4,297,903, Cl. 73-864.220.

Byford, Roger G., to British Broadcasting Corporation. Decoding shortened cyclic block codes. 4,298,981, Cl. 371-37.000.

C. L. Frost & Son, Inc.: *See*—
Frost, Charles C.; and Weis, Siegfried K., 4,297,959, Cl. 113-116.0HH.
Gurney, Gerald W., 4,297,839, Cl. 59-85.000.
Gurney, Gerald W.; and Lanham, William E., Jr., 4,297,840, Cl. 59-85.000.

C. Sherman Johnson Company, Inc.: *See*—
Johnson, Curtiss S., Jr., 4,297,962, Cl. 114-218.000.

Cabot Berylco Inc.: *See*—
Langdon, C. Ray; and Burkart, Alan R., 4,298,408, Cl. 148-32.000.

Cabot Corporation: *See*—
Douglas, Donald A.; Menashi, Jameel; and Rappas, Alkis S., 4,298,581, Cl. 423-58.000.
Menashi, Jameel; Rappas, Alkis S.; and Douglas, Donald A., 4,298,582, Cl. 423-58.000.

Cadeddu, Leonardo, to Benditalia S.p.A. Two-compartments fluid reservoir. 4,297,846, Cl. 60-585.000.

Calcagno, Giancarlo, to Ligurchim S.r.l. Preparation of thion- and thiol-carbamic esters. 4,298,524, Cl. 260-239.0BF.

Calcasola, Richard W.: *See*—
Sundermeyer, Frank D.; and Calcasola, Richard W., 4,298,959, Cl. 364-900.000.

California R & D Center: *See*—
Jones, Lawrence T.; Sims, Anson; Howden, Ashley G.; Knighton, Mark S.; and Kingsbury, LC James, 4,298,788, Cl. 219-386.000.

Campbell, Grover L.; and Hobbs, James W., to Phillips Petroleum Co. Fractionator feed tank pressure control. 4,298,363, Cl. 62-21.000.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See*—
Baker, Charles L., 4,298,984, Cl. 375-40.000.

Cancio, Leopoldo V.; and Wu, Pai-Chuan, to Clopay Corporation. Cross-tearable decorative sheet material. 4,298,647, Cl. 428-167.000.

Caneer, Clifford, Jr.: *See*—
Anderson, Ronald B.; Caneer, Clifford, Jr.; and Maki, Terrance C., 4,297,771, Cl. 24-263.0DA.

Canon Kabushiki Kaisha: *See*—
Kawamura, Masaharu; Shigeta, Yoshihiro; Uchidoi, Masanori; Sugiura, Yoji; and Yamamoto, Hiroshi, 4,298,256, Cl. 354-23.00D.
Marushima, Giichi; Tanaka, Hiroshi; Tosaka, Umi; Takahashi, Shinkichi; and Komiyu, Takao, 4,298,669, Cl. 430-55.000.
Murai, Keiichi; and Matsuo, Takehiko, 4,298,670, Cl. 430-67.000.
Sugiura, Muneharu; Minoura, Kazuo; and Minami, Setsuo, 4,298,271, Cl. 355-8.000.
Tajima, Hatsuo; Hosono, Nagao; and Kanbe, Junichiro, 4,297,970, Cl. 118-652.000.
Togo, Shoichi; and Miyashita, Takeshi, 4,298,257, Cl. 354-23.00D.
Torigai, Akiyoshi, 4,297,969, Cl. 118-652.000.
Yoshimura, Shigeru; Nomura, Akihiro; and Hayakawa, Kimiaki, 4,298,279, Cl. 355-133.000.

Canron Corp.: *See*—
Pearson, Eugene W.; and Short, Wilbur G., 4,297,870, Cl. 72-443.000.

Capozzi, Anthony J., to International Business Machines Corporation. Integrated multilevel storage hierarchy for a data processing system with improved channel to memory write capability. 4,298,929, Cl. 364-200.000.

Cardiac Pacemakers, Inc.: *See*—
Wright, Thomas C.; Hudrlik, Terrence R.; Mills, Perry A.; Rust, Robert C.; and Wallner, Thomas G., 4,298,007, Cl. 128-419.0PG.

Cardot, Claude R., to Compagnie Internationale Pour l'Informatique CII Honeywell Bull. Method of and apparatus for reading data from reference zones of a memory. 4,298,898, Cl. 360-67.000.

Carette, Jean-Denis; and Bouchard, Claude. Ion-electron source with channel multiplier having a feedback region. 4,298,817, Cl. 313-362.100.

Cargill Incorporated: *See*—
Moulson, Thomas J.; and Greenzweig, John E., 4,298,711, Cl. 525-40.000.

Caridis, Andrew A.: *See*—
Benson, Clark K.; Caridis, Andrew A.; and Nilsen, Arthur A., 4,297,942, Cl. 99-386.000.

Carl Freudenberg, Firma: *See*—
Holzer, Helmut; and von Arndt, Ernst M., 4,298,203, Cl. 277-152.000.
Rutsch, Peter W.; and Brehm, Michael, 4,298,556, Cl. 264-46.600.

Carl Maxey Company, The: *See*—
Maxey, Carl W.; and Leyde, Warren, 4,298,286, Cl. 356-381.000.

Carlson, Curt T.: *See*—
Natitus, Donald P.; and Carlson, Curt T., 4,298,863, Cl. 340-573.000.

Carlson, David H. J., to UOP Inc. Catalytic composite particularly useful for the oxidation of mercaptans and the removal of gums contained in a sour petroleum distillate. 4,298,502, Cl. 252-431.00N.

Carney, Thomas B.: *See*—
Sullivan, Roger M., 4,298,875, Cl. 343-112.0CA.

Carrier Corporation: *See*—
Post, John E., 4,298,164, Cl. 236-49.000.

Carrupt, Pierre-Alain: *See*—
Vogel, Pierre; and Carrupt, Pierre-Alain, 4,298,535, Cl. 260-365.000.

Carstensen, Franklin E., to American Industries Inc. Six lever racing clutch. 4,298,112, Cl. 192-70.290.

Carter, Jackie L.; and Carter, Jerry D. Bale handling apparatus. 4,298,301, Cl. 414-24.600.

Carter, Jerry D.: *See*—
Carter, Jackie L.; and Carter, Jerry D., 4,298,301, Cl. 414-24.600.

Case, Edward M.: *See*—
Hopper, Chester S.; and Case, Edward M., 4,298,207, Cl. 277-230.000.

Casey, Horace C., Jr.; Cho, Alfred Y.; and Foy, Philip W., to Bell Telephone Laboratories, Incorporated. Method of fabricating GaAs devices utilizing a semi-insulating layer of AlGaAs in combination with an overlying masking layer. 4,297,783, Cl. 29-578.000.

Cash, John R.: *See*—
Van Steenwyk, Donald H.; Cash, John R.; and Ott, Paul W., 4,297,790, Cl. 33-313.000.

Casson, Harold V.; Crabtree, Grant G.; Kindl, Bruno; and Noonan, Edward B., to Huron Chemicals Limited. Protection of substrates against corrosion. 4,298,416, Cl. 156-87.000.

Castillo, Tomas R.; and Gardiner, Arthur L., to United States of America, Army. Ammunition feeder. 4,297,939, Cl. 89-33.00L.

Cegedur Societe de Transformation de l'Aluminium Pechiney: *See*—
Kucza, Jean-Claude; Mastrot, Albert; Perrot, Rene; and Wattier, Jean-Mary, 4,297,777, Cl. 29-420.000.

Celanese Corporation: *See*—
Taskier, Henry T., 4,298,666, Cl. 429-206.000.
Turnbull, John, 4,298,648, Cl. 428-195.000.

Cerankowski, Leon D.: *See*—
Land, Edwin H.; Cerankowski, Leon D.; and Mattucci, Neil, 4,298,674, Cl. 430-213.000.

Chahroudi, Day, to Heat Mirror Associates. Method for multilayer thin film deposition. 4,298,444, Cl. 204-192.00R.

Champion International Corporation: *See*—
Cottrell, Edward D., 4,298,118, Cl. 198-382.000.
Roccaforte, Harry I.; and Hanko, Jimmy J., 4,298,123, Cl. 206-396.000.

Chang, Ching-Te; and Su, Tsung-Tsan, to Industrial Technology Research Institute. O-Aminoalkylsalicylates. 4,298,603, Cl. 424-230.000.

Chapman, John F., to Rolls-Royce Limited. Multi-layer acoustic linings. 4,298,090, Cl. 181-286.000.

Chaudorge, Emile, to Chauoronnerie Tolerie Industrielle d'Angerrville "CTIA". Apparatus for loading solid material into a container. 4,298,306, Cl. 414-525.00R.

Chauoronnerie Tolerie Industrielle d'Angerrville "CTIA": *See*—
Chaudorge, Emile, 4,298,306, Cl. 414-525.00R.

Chauvel, Alain Y.: *See*—
Berthier, Marc A.; and Chauvel, Alain Y., 4,298,227, Cl. 297-58.000.

Chemed Corporation: *See*—
Haggard, William J., 4,298,018, Cl. 137-3.000.

Chemplex Company: *See*—
Machonis, John, Jr.; Schmukler, Seymour; Zeitlin, Robert J.; and Shida, Mitsuzo, 4,298,712, Cl. 525-74.000.

Cheng, Dah Y., to International Power Technology, Inc. Control system for Cheng dual-fluid cycle engine system. 4,297,841, Cl. 60-39.300.

Cheng, Hsiung; and Wintersdorff, Peter, to Merck & Co., Inc. Xanthan gum-modified starches. 4,298,729, Cl. 536-102.000.

Cheng, William J.; and Guthrie, David B., to Petrolite Corporation. Low temperature process of preparing $Mg(OH)_2$ suspensions. 4,298,482, Cl. 252-25.000.

Chesler, Ronald B.: *See*—
Dabby, Franklin W.; and Chesler, Ronald B., 4,298,366, Cl. 65-3.120.

Chester, Arthur W.: *See*—
Butter, Stephen A.; Chester, Arthur W.; and Schwartz, Albert B., 4,298,695, Cl. 518-720.000.

Chimura, Kozo: *See*—
Ogihara, Masuo; Chimura, Kozo; Shinozaki, Nobuo; and Seki, Yoichi, 4,298,972, Cl. 368-222.000.

Cho, Alfred Y.: *See*—
Casey, Horace C., Jr.; Cho, Alfred Y.; and Foy, Philip W., 4,297,783, Cl. 29-578.000.

Chow, Ming-Chwan: *See*—
Abbott, Robert P.; Chow, Ming-Chwan; Cirillo, Anthony J.; Drechsler, Rudolph C.; and Horney, Lee F., II, 4,298,977, Cl. 370-62.000.

Christensen, Burton G.; Guthikonda, Ravindra N.; and Ratcliffe, Ronald W., to Merck & Co., Inc. 6-Amido-3-substituted-1-azabicyclo[3.2.0]-hept-2-en-7-one-2-carboxylic acid. 4,298,741, Cl. 546-272.000.

Christenson, Roger M.: *See*—
Schimmel, Karl F.; Seiner, Jerome A.; Dowbenko, Rostyslaw; and Christenson, Roger M., 4,298,511, Cl. 260-29.2TN.

Christianson, Tony. Pilot controlled regulator second stage. 4,297,998, Cl. 128-204.260.

Christini, James N.: *See*—
Powers, John A.; and Christini, James N., 4,298,485, Cl. 252-49.700.

Christopher, Glenn B.: *See*—
Regalbuto, John A.; and Christopher, Glenn B., 4,298,063, Cl. 166-55.000.

Christou, Aristos: *See*—
Davey, John E.; and Christou, Aristos, 4,298,403, Cl. 148-1.500.

Chugai Seiyaku Kabushiki Kaisha: *See*—
Oi, Nobuhiro; Aoki, Bunya; Shinozaki, Teizo; Moro, Kanji; Matsunaga, Isao; Noto, Takao; Nebashi, Toshiyuki; Harada, Yusuke; Endo, Hisao; Kimura, Takao; Okazaki, Hiroshi; Ogawa, Haruki; and Shindo, Minoru, 4,298,605, Cl. 424-246.000.

Ciba-Geigy Ag: *See*—
Tzikas, Athanassios, 4,298,536, Cl. 260-378.000.

Ciba-Geigy Corporation: *See*—
Lange, Burkhart; Agarwal, Suresh C.; Fringeli, Werner; and Gunter, Franz, 4,298,490, Cl. 252-91.000.
Schupp, Thomas; Traxler, Peter; and Nuesch, Jakob, 4,298,692, Cl. 435-119.000.

Cillario, Renzo, to P. Ferrero & C. S.p.A. Sweet protein food product in the form of a foamed plastic mass. 4,298,625, Cl. 426-572.000.

Circello, Joseph C.: *See*—
Guenthner, Russell W.; Circello, Joseph C.; and Galcik, Anthony J., 4,298,952, Cl. 364-786.000.

Cirillo, Anthony J.: *See*—
Abbott, Robert P.; Chow, Ming-Chwan; Cirillo, Anthony J.; Drechsler, Rudolph C.; and Horney, Lee F., II, 4,298,977, Cl. 370-62.000.

Citizen Watch Company Limited: *See*—
Morokawa, Shigeru; and Koga, Keiichiro, 4,298,971, Cl. 368-204.000.
Nihira, Shohachi, 4,297,944, Cl. 101-93.310.
Saito, Motoyuki, 4,298,973, Cl. 368-276.000.
Watanabe, Minoru; Kume, Kazunari; Ohno, Hideshi; and Tamaru, Munetaka, 4,297,838, Cl. 368-76.000.

CKD Praha, obrovy podnik: *See*—
Homola, Jaroslav; Remajzl, Karel; and Prokes, Milan, 4,298,882, Cl. 357-38.000.

Clark, Mark L.: *See*—
DeFord, Henry S.; and Clark, Mark L., 4,298,496, Cl. 252-359.00A.

Clark, Richard E.: *See*—
Davis, Robert B.; Skelton, John; Clark, Richard E.; and Swanson, Wilbur M., 4,297,749, Cl. 3-1.500.

Clark, Rodney L.; Kidder, Kenneth B.; and Peterson, Gary A., to Honeywell Inc. Dynamically checked safety load switching circuit. 4,298,334, Cl. 431-24.000.

Clarke, David B., to Tenneco Chemicals, Inc. High temperature grease compositions. 4,298,481, Cl. 252-21.000.

Claussen, Nils; and Steeb, Jorg, to Max-Planck-Gesellschaft zur Forderung Wissenschaften e.V. High-strength ceramic bodies. 4,298,385, Cl. 501-105.000.

Clayton, Carl C., to PPG Industries, Inc. Conversion of geothermal energy from subterranean cavities. 4,297,847, Cl. 60-641.300.

Clayton, Kenneth H.; Denniston, Charles D.; Guetersloh, Donald G.; and Hallmann, Melvin H., to General Motors Corporation. Automatic belt tensioner. 4,298,342, Cl. 474-110.000.

Clayton, Ralph S. Method and device for retaining colon cleansing tube in place. 4,297,997, Cl. 128-169.000.

Clopay Corporation: *See*—
Cancio, Leopoldo V.; and Wu, Pai-Chuan, 4,298,647, Cl. 428-167.000.

Clover Mfg. Co., Ltd.: *See*—
Gakiya, Yoshiaki, 4,298,148, Cl. 223-37.000.

Coal Industry (Patents) Limited: *See*—
Randell, Arthur A., 4,298,339, Cl. 432-15.000.

Cochran, Jerry R.; Insinger, Thomas H.; Hollenbach, Gerald E.; Piskorz, Ronald F.; and Smith, Addison M., to Allied Corporation. Purification of phenol with reduced energy consumption. 4,298,765, Cl. 568-754.000.

Cogdill, William F., to Safetran Systems Corporation. Rail handling tongs. 4,298,225, Cl. 294-118.000.

Coin Acceptors, Inc.: *See*—
Niemeyer, John F., 4,298,116, Cl. 194-97.00R.

Colan, Laura P. Footwear system. 4,297,798, Cl. 36-101.000.

Colditz, Johannes K. E., to U.S. Philips Corporation. Neutron generator having a target. 4,298,804, Cl. 376-108.000.

Cole, Jack L., to Nalco Chemical Company. Regeneration of cation ion-exchange polishers. 4,298,477, Cl. 210-674.000.

Cole, Robert J. Die for the extrusion of material in tube form. 4,298,325, Cl. 425-192.00R.

Colgate-Palmolive Company: *See*—
Schreiber, Ronald S., 4,298,493, Cl. 252-135.000.
Wixon, Harold E., 4,298,480, Cl. 252-8.750.

Colles, Joseph H.; and Cooper, James E., Jr., to Hughes Aircraft Company. Non-interlaced to interlaced format video converter. 4,298,888, Cl. 358-140.000.

Collette, John W.; and Tullock, Charles W., to Du Pont de Nemours, E. I., and Company. Fractionable, elastomeric poly (1-butene). 4,298,722, Cl. 526-348.600.

Collins, William J. Sampler for molten material and a component thereof. 4,297,902, Cl. 73-863.330.

Colombo, Paul T., to Nalco Chemical Company. Composition for preventing cold end corrosion in boilers. 4,298,497, Cl. 252-387.000.

Colonna, Jean; Fitremann, Jean-Michel; Genin, Richard; and Sarda, Jean-Paul, to Institut Francais du Petrole. Process and device for injecting a liquid agent used for treating a geological formation in the vicinity of a well bore traversing this formation. 4,298,066, Cl. 166-300.000.

Colsher, James G.: *See*—
Stoub, Everett W.; Colsher, James G.; and Muehllehner, Gerd, 4,298,944, Cl. 364-515.000.

Columbia Machine, Inc.: *See*—
Neth, Walter, 4,298,305, Cl. 414-498.000.

Combustion Engineering, Inc.: *See*—
Anthony, Andrew J.; and Groves, Malcolm D., 4,298,434, Cl. 376-364.000.

Cominco Ltd.: *See*—
Sakauye, Randall T.; Marlow, John V.; Laurie, Gordon H.; and Seymour, Theodore J., 4,297,866, Cl. 72-186.000.

Commerciale de Materiel Aeronautique: *See*—
Marechal, Robert, 4,297,912, Cl. 74-501.00R.

Commissariat a l'Energie Atomique: *See*—
Depierre, Yves; Figuet, Jacques A.; and Lemercier, Guy, 4,298,431, Cl. 176-290.000.

Communications Satellite Corporation: *See*—
Dobyns, Thomas R.; Lindstrom, Richard R.; and Ridings, Robert P., 4,298,979, Cl. 370-104.000.

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Herbelleau, Yves; and Flechtner, Charles, 4,298,046, Cl. 152-209.00R.

Compagnie Industrielle Radioelectrique: *See*—
Favre, Nicolas, 4,298,807, Cl. 250-562.000.
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Cardot, Claude R., 4,298,898, Cl. 360-67.000.
Compagnie Internationale Pour l'Informatique Oil-Honeywell Bull (Societe Anonyme): *See*—
Phelps, Edwin H., 4,298,634, Cl. 427-183.000.
Computome Corporation: *See*—
Goldman, Arnold, 4,298,800, Cl. 250-445.00T.
ComSonics, Inc.: *See*—
Shimp, Richard L., 4,298,844, Cl. 330-124.00D.
Concast AG: *See*—
Knell, Bernhard; and Rohrig, Adalbert, 4,298,052, Cl. 164-416.000.
Condouris, George A.; Yelnosky, John; Riley, Richard L.; Won, Chong M.; Douglas, George H.; and Studt, William L., to William H. Rorer, Inc. Method for blocking high frequency nerve stimulation. 4,298,608, Cl. 424-249.000.
Congoleum Corporation: *See*—
Haemer, Laurence F.; and Kimak, Theodore, 4,298,646, Cl. 428-159.000.
Conley, Dwain D.: *See*—
Blaney, Peter G.; Conley, Dwain D.; and Zeigner, Willard L., 4,297,899, Cl. 73-861.580.
Conoco Inc.: *See*—
Hein, Norman W., Jr.; and Oertle, Donald H., 4,297,885, Cl. 73-587.000.
Conrad, Jens: *See*—
Gerhardt, Werner; Wehle, Volker; Syldatk, Andreas; Rogall, Gabriele; Reiffert, Jurgen; and Conrad, Jens, 4,298,568, Cl. 422-16.000.
Consortium fur Elektrochemische Industrie GmbH: *See*—
Kratel, Gunter; Katzer, Hans; Loskot, Stephan; Lang, Wilfried; and Weis, Klaus, 4,298,387, Cl. 501-92.000.
Consumers Glass Company Limited: *See*—
Mancini, Derek V.; and Wright, William J., 4,298,137, Cl. 221-11.000.
Control Data Corporation: *See*—
Norberg, Gayle R.; and Hartung, Lee R., 4,298,860, Cl. 340-825.040.
Cook, Frank T.; and Prier, Donald G., to Dow Chemical Company, The. Process for the production of propylene glycol esters from chloropropyl ethers. 4,298,758, Cl. 560-240.000.
Coombs, Daniel M.; and Boesiger, Dwight D., to Phillips Petroleum Company. Oil purification by deasphalting and magneto-filtration. 4,298,456, Cl. 208-86.000.
Cooper, James E., Jr.: *See*—
Colles, Joseph H.; and Cooper, James E., Jr., 4,298,888, Cl. 358-140.000.
Cooper, John, to Imperial Chemical Industries Limited. Hardenable resin compositions. 4,298,510, Cl. 260-29.20E.
Copeland, Terry M., to Du Pont de Nemours, E. I., and Company. Cathode and cell for lowering hydrogen overvoltage in a chlor-akali cell. 4,298,447, Cl. 204-252.000.
Cordes, Johan H.; and Roes, Wilhelmus F. M., to Akzo N.V. Plasticizer-containing thermocurable composition. 4,298,519, Cl. 260-33.8UA.
Cornell Research Foundation, Inc.: *See*—
Farrell, James J.; and Donohoe, Anthony J., 4,297,813, Cl. 52-2.000.
Corning Glass Works: *See*—
Bailey, Alan C.; and Morrow, Alan J., 4,298,365, Cl. 65-3.120.
Blaszyk, Paul E.; and Murphy, Susan F., 4,298,364, Cl. 65-3.110.
Dorfeld, William G.; and Settzo, Robert J., 4,298,505, Cl. 252-513.000.
Flannery, James E.; Stempin, John L.; and Wexell, Dale R., 4,298,390, Cl. 501-32.000.
Frost, Rodney I., 4,298,328, Cl. 425-376.00A.
Johnson, Lauren K.; and Thompson, David A., 4,298,389, Cl. 501-77.000.
Stempin, John L.; and Wexell, Dale R., 4,298,382, Cl. 75-202.000.
Corrado, Anthony P.; and Marchese, Vincent P., to EMX Controls, Inc. Electronic actuated bleed valve. 4,298,181, Cl. 251-129.000.
Cortese, Richard: *See*—
Theeuwes, Felix; and Cortese, Richard, 4,298,003, Cl. 128-260.000.
Cosper, David R.: *See*—
Breslin, Michael D.; and Cosper, David R., 4,298,428, Cl. 162-73.000.
Costello, Kenneth. Gear box. 4,297,906, Cl. 74-410.000.
Cottrell, Edward D., to Champion International Corporation. Stick separating apparatus with improved radiation counter. 4,298,118, Cl. 198-382.000.
Coules, Ronald A., to Unarco Industries, Inc. Locking stand off. 4,297,769, Cl. 174-138.00D.
Coulter Electronics, Inc.: *See*—
Groves, Michael R.; and Coulter, Wallace H., 4,298,836, Cl. 324-71.0CP.
Coulter, Wallace H.: *See*—
Groves, Michael R.; and Coulter, Wallace H., 4,298,836, Cl. 324-71.0CP.
Counselor, Gary D.; Gerst, Robert C.; and Pennington, Reginald A., to Westran Corporation. Method for assembling molds. 4,298,049, Cl. 164-30.000.
Courson, Richard B., to Almo Manifold and Tool Company. Lock nut. 4,298,297, Cl. 411-262.000.
Covington Brothers Technologies: *See*—
Artzer, Richard F., 4,297,820, Cl. 52-309.110.
Coxon, Andrew C.; Edge, David J.; and Lapper, Mark L. L., to Lever Brothers Company. Process for making detergent compositions. 4,298,491, Cl. 252-95.000.
Crabtree, Grant G.: *See*—
Casson, Harold V.; Crabtree, Grant G.; Kindl, Bruno; and Noonan, Edward B., 4,298,416, Cl. 156-87.000.
Cragoe, Edward J., Jr.; Rooney, Clarence S.; and Williams, Haydn W. R., to Merck & Co., Inc. 4-(Substituted phenyl thiazolyl)-3-hydroxy-3-pyrroline-2,5-diones. 4,298,743, Cl. 548-203.000.
Craig, Philip V. C., to System Concepts, Inc. Cathode ray tube character smoother. 4,298,867, Cl. 340-728.000.
Craig, Roderick I.: *See*—
Kyte, Derek J.; Hansen, Walter I.; and Craig, Roderick I., 4,298,945, Cl. 364-523.000.
Credelle, Thomas L.; and Gange, Robert A., to RCA Corporation. Beam Clean up structure for flat panel display devices. 4,298,819, Cl. 313-422.000.
Critchlow, James A.; and Ozern, Donna U., to Xerox Corporation. Radially varying transmission filter for wide angle copying device. 4,298,275, Cl. 355-71.000.
Crochet, Pierre, to Thomson-CSF. Polarizer for microwave antenna. 4,298,876, Cl. 343-756.000.
Crosby, Gerald D.: *See*—
Torregrossa, Louis O.; Bentvelzen, Jozef M.; Crosby, Gerald D.; Meredith, Michael D.; and Bepple, Henry, 4,298,426, Cl. 162-57.000.
Crouse, Stephen K., to Deere & Company. Transmission shift control linkage for controlling both speed and direction changes with one input motion. 4,297,909, Cl. 74-473.00R.
Crysdale, Donald T., to E Z Paintr Corporation. Paint tray and reservoir. 4,297,762, Cl. 15-257.060.
Cuatrecasas, Pedro: *See*—
Parikh, Indu; and Cuatrecasas, Pedro, 4,298,685, Cl. 435-7.000.
Cunha, Richard A.: *See*—
Riordan, William J.; and Cunha, Richard A., 4,298,335, Cl. 431-25.000.
Curchod, Donald B.; and Sherman, Donald R., to Autotron Equipment Corporation. Wheel balancer transducer mount with improved signal to noise ratio. 4,297,882, Cl. 73-460.000.
Currier Piano Company, Inc.: *See*—
Mayerjak, Robert J., 4,297,937, Cl. 84-430.000.
CX Corporation: *See*—
Putzke, Dwayne H., 4,297,930, Cl. 83-156.000.
Dabby, Franklin W.; and Chesler, Ronald B., to Times Fiber Communications, Inc. Graded start rods for the production of optical waveguides. 4,298,366, Cl. 65-3.120.
Dages, Charles L., to Jerrold Electronics Corp. Digital channel selection and fine tuning system. 4,298,988, Cl. 455-182.000.
Daichiku Company, Limited: *See*—
Oide, Kunimasa; and Ishii, Hideo, 4,298,121, Cl. 206-347.000.
Daigne, Bernard: *See*—
Bernard, Claude R.; Daigne, Bernard; and Girard, Francois, 4,298,797, Cl. 250-372.000.
Daikoku, Takahiro; and Oguro, Tomokatsu, to Hitachi, Ltd. Magnetron device. 4,298,825, Cl. 315-39.510.
Dailey Oil Tool, Inc.: *See*—
Lawrence, James D., 4,298,078, Cl. 175-72.000.
D'Alli, Sebastian J. Process for dry mining phosphate ore utilizing a supersonic gas. 4,298,229, Cl. 299-7.000.
Damiron, Rene; Gillet, Roger; Heuillard, Jean-Francois; and Ruelle, Gilbert, to Alsthom-Atlantique. Gas cooled rotor for an electric machine. 4,298,812, Cl. 310-61.000.
Damon Corporation: *See*—
Sodickson, Lester A.; and Lim, Franklin, 4,298,345, Cl. 23-230.00R.
D'Andrade, Bruce M., to Arco Industries Ltd. Tethered toy for orbital movement. 4,297,808, Cl. 46-52.000.
D'Andrea, Mark J.: *See*—
Ronel, Samuel H.; D'Andrea, Mark J.; Dobelle, William H.; Klomp, Gregory F.; and Hashiguchi, Hiroshi, 4,298,002, Cl. 128-260.000.
Danfoss A/S: *See*—
Kyster, Erik, 4,297,845, Cl. 60-384.000.
Daniel, Chelliah; and Bursky, Phyllis L., to Ashland Oil, Inc. Catalytic oxydehydrogenation process. 4,298,755, Cl. 560-214.000.
Daniel, Jean-Claude; Grossoleil, Jacques; and Roullet, Robert, to Rhone-Poulenc Industries. Method of applying a binder having less than 0.5% water soluble compounds to tufted floor coverings. 4,298,637, Cl. 427-372.200.
Danielsson, Knut O.: *See*—
Ranzen, Carl-Olov B.; and Danielsson, Knut O., 4,298,425, Cl. 162-18.000.
Dantzer, Elonne: *See*—
Goldfarb, Adolph E.; and Dantzer, Elonne, 4,298,915, Cl. 362-124.000.
Dantzig, Jonathan A.; and Tyler, Derek E., to Swiss Aluminium Ltd. Apparatus for inline degassing and filtration of molten metal. 4,298,187, Cl. 266-217.000.
Daransky, Thomas E.; and Dickinson, John D., to Westinghouse Electric Corp. Method and system for controlling the fluid level in a drain tank. 4,298,019, Cl. 137-9.000.
Dartmouth College: *See*—
Walsh, John E., 4,298,824, Cl. 315-4.000.
D'Atre, John D.: *See*—
Espelage, Paul M.; and D'Atre, John D., 4,298,831, Cl. 318-112.000.

Dauben, William G.; Kessel, Carl R.; and Takemura, Kazuo H., to University of California, Regents of the. Cycloadduct precursors of cantharidin and method. 4,298,752, Cl. 549-42.000.

Davey, John E.; and Christou, Aristos. Ion-implanted evaporated germanium layers as $n^+$ contacts to GaAs. 4,298,403, Cl. 148-1.500.

Davids, Ralf: *See*—
Bauer, Erwin; Davids, Ralf; Gotz, Gerhard; Jussen, Hilmar; Arndt, Heinrich; Kummel, Louis; Morhart, Rudolf; and Pollak-Banda, Erich, 4,297,917, Cl. 74-665.00G.

Davies, Irving W., to Jaco Manufacturing Company. Tube coupling. 4,298,222, Cl. 285-341.000.

Davis, Dean T., to IRD Mechanalysis, Inc. Method and apparatus for generating a digital representation of the instantaneous angular position of a rotating body and for generating rectangular coordinate equivalents thereof. 4,298,948, Cl. 364-603.000.

Davis, Paul, to Sweetheart Plastics, Inc. Integral tray and cover with snap lock. 4,298,133, Cl. 220-306.000.

Davis, Richard F., to Dayco Corporation. Curved mandrel for curing polymeric hose and method. 4,298,330, Cl. 425-392.000.

Davis, Robert B.; Skelton, John; Clark, Richard E.; and Swanson, Wilbur M., to Albany International Corp.; and Washington University. Heart valve prosthesis. 4,297,749, Cl. 3-1.500.

Davis, Robert H.; and Herd, Richard S., to Mobil Oil Corporation. Metal forming lubricants. 4,298,483, Cl. 252-32.7HC.

Davister, Armand L.; and Houghtaling, Samuel V., to Davy Powergas, Inc. Process for manufacturing phosphoric acid. 4,298,583, Cl. 423-167.000.

Davy McKee (Minerals & Metals) Limited: *See*—
Atkinson, Donald A.; and McCulloch, Colin F., 4,298,191, Cl. 266-165.000.

Davy Powergas, Inc.: *See*—
Davister, Armand L.; and Houghtaling, Samuel V., 4,298,583, Cl. 423-167.000.

Dayco Corporation: *See*—
Davis, Richard F., 4,298,330, Cl. 425-392.000.

Dearth, Miles B. Attachment for a vehicle dome light. 4,298,912, Cl. 362-66.000.

de Bont, Marinus R. J.: *See*—
van der Veen, Jan; Kivits, Petrus J.; and de Bont, Marinus R. J., 4,298,975, Cl. 369-94.000.

Decker, Forrest W.; and Peternel, Jacob R., to PPG Industries, Inc. Method of and apparatus for determining number of sheets in a stack. 4,298,790, Cl. 235-92.0SB.

Deconinck, Hugo F.: *See*—
Stievenart, Emile F.; and Deconinck, Hugo F., 4,298,272, Cl. 355-28.000.

DeCristofaro, Nicholas J.; Freilich, Alfred; and Nathasingh, Davidson M., to Allied Chemical Corporation. Method for making iron-metalloid amorphous alloys for electromagnetic devices. 4,298,409, Cl. 148-108.000.

Deemer, W. Robert: *See*—
McCarter, Louis N., III; Deemer, W. Robert; Meeker, Robert G.; Weaver, Harry B.; and Smith, John W., 4,298,287, Cl. 366-4.000.

Deep Oil Technology, Inc.: *See*—
Horton, Edward E.; and Walker, Raymond W., 4,297,965, Cl. 114-265.000.

Deere & Company: *See*—
Crouse, Stephen K., 4,297,909, Cl. 74-473.00R.
Hutchison, Wayne R., 4,298,108, Cl. 192-13.00R.

Defibaugh, George R.: *See*—
Swengel, Robert C., Jr.; Fortuna, Jon A.; and Defibaugh, George R., 4,298,243, Cl. 339-276.00F.

Defibrator Aktiebolag: *See*—
Ranzen, Carl-Olov B.; and Danielsson, Knut O., 4,298,425, Cl. 162-18.000.

DeFord, Henry S.; and Clark, Mark L., to United States of America, Energy. Highly stable aerosol generator. 4,298,496, Cl. 252-359.00A.

De Fries, Donald. Combination portable storage container and head rest. 4,298,103, Cl. 190-42.000.

DeFusco, Douglas F., to B. B. Greenberg Company. Automatic soldering machine. 4,298,154, Cl. 228-49.00R.

Degner, Dieter; Siegel, Hardo; and Hannebaum, Heinz, to BASF Aktiengesellschaft. Preparation of 4-tert.-butylbenzaldehyde. 4,298,438, Cl. 204-78.000.

Dehli, Diane M., to General Electric Company. Retractable handle for air valve heat pump. 4,297,853, Cl. 62-325.000.

Dejob, Roger M.; and Tardivon, Marcel P., to Etat Francais represente par le Delegue Ministeriel pour l'Armement. Jettisoning and flotation device for a suspended load, particularly an underwater listening body. 4,298,963, Cl. 367-4.000.

Dellinger, Bill: *See*—
Stirtz, Ronald H.; and Dellinger, Bill, 4,297,796, Cl. 36-28.000.

Dennis, Charles L., to Mobil Oil Corporation. Regulator for a pulsed neutron source. 4,298,805, Cl. 376-111.000.

Denniston, Charles D.: *See*—
Clayton, Kenneth H.; Denniston, Charles D.; Guetersloh, Donald G.; and Hailmann, Melvin H., 4,298,342, Cl. 474-110.000.

De Paulet, Andre C.: *See*—
Nicolas, Jean C.; Terouanne, Beatrice; Descomps, Bernard; and De Paulet, Andre C., 4,298,686, Cl. 435-7.000.

Depierre, Yves; Figuet, Jacques A.; and Lemercier, Guy, to Commissariat a l'Energie Atomique. Device for the thermal protection of an internal structure of a liquid metal cooled fast reactor. 4,298,431, Cl. 176-290.000.

de Rigal, Jean P.: *See*—
Leveque, Jean-Luc; Rasseneur, Laurent; de Rigal, Jean P.; and Gras, Gilbert, 4,297,884, Cl. 73-579.000.

Deroker Equipment Ltd.: *See*—
Djukastein, Klaus, 4,298,464, Cl. 209-310.000.

DeSantis, Raymond P.; and Puffer, Herbert J., Jr., to PTX-Pentronix, Inc. Apparatus and method for compacting prismatic or pyramidal articles from powder material. 4,298,563, Cl. 264-111.000.

Descolas, Jean, to Aktiebolaget Svenska Flaktfabriken. Method of and device for cleansing in a fibre blanket manufacturing plant. 4,298,367, Cl. 65-4.100.

Descomps, Bernard: *See*—
Nicolas, Jean C.; Terouanne, Beatrice; Descomps, Bernard; and De Paulet, Andre C., 4,298,686, Cl. 435-7.000.

Deutsche Industrieanlagen GmbH Werk Hermann Kolb Maschinenfabrik Koeln: *See*—
Russ, Peter; and Jansen, Heinz, 4,297,926, Cl. 82-9.000.

DeVierno, Richard A. Separator and storage box. 4,298,157, Cl. 229-35.000.

Devore, Ernest W.: *See*—
Arter, Nelson K.; Devore, Ernest W.; Wills, Arthur B.; and Zelenka, Leslie R., 4,298,897, Cl. 360-39.000.

Diab, Khaled M. Method and system for 5-bit encoding of complete Arabic-Farsi languages. 4,298,773, Cl. 178-30.000.

Diamond International Corporation: *See*—
Reifers, Richard F.; and Lord, Henry A., 4,298,156, Cl. 229-2.50R.

Diamond Shamrock Corporation: *See*—
Baczek, Stanley K.; and McCain, G. Howard, 4,298,697, Cl. 521-27.000.

Dick, Calvin; and Malone, Patrick C.; to Dick, Calvin. Convertible furniture. 4,297,752, Cl. 5-52.000.

Dickinson, John D.: *See*—
Daransky, Thomas E.; and Dickinson, John D., 4,298,019, Cl. 137-9.000.

Dickinson, William B.: *See*—
Lesher, George Y.; and Dickinson, William B., 4,298,609, Cl. 424-250.000.

Di Drusco, Giovanni: *See*—
Mayr, Adolfo; Galli, Paolo; Susa, Ermanno; Di Drusco, Giovanni; and Giachetti, Ettore, 4,298,718, Cl. 526-125.000.

Diederich, Ronald E.: *See*—
Howells, Anthony P.; Diederich, Ronald E.; and Angehrn, Jorg A., 4,297,879, Cl. 73-152.000.

Dienst, Manfred: *See*—
Anders, Dietmar; and Dienst, Manfred, 4,298,322, Cl. 425-147.000.

DiFulvio, Anthony P.; and Smith, Michael R., to Eastman Kodak Company. Incubator including cover means for an analysis slide. 4,298,571, Cl. 422-65.000.

DiGiacomo, Peter M.; and Dines, Martin B., to Occidental Research Corporation. Layered or amorphous acyclic organometallic inorganic polymers. 4,298,723, Cl. 528-271.000.

DiGiulio, Adolph V.; and Bauer, Jack N., to ARCO Polymers, Inc. Fire-retardant imide copolymers. 4,298,703, Cl. 521-88.000.

DiGiulio, Adolph V.; and Bauer, Jack N., to ARCO Polymers, Inc. Fire-retardant monocarboxylic acid amide copolymers. 4,298,704, Cl. 521-88.000.

DiGiulio, Adolph V., to Arco Polymers, Inc. Rubber-modified fire-retardant imide copolymers. 4,298,705, Cl. 521-88.000.

Dines, Martin B.: *See*—
DiGiacomo, Peter M.; and Dines, Martin B., 4,298,723, Cl. 528-271.000.

Dinger, Edward H.; and Ritter, Allen M., to General Electric Company. Semiconductor device conduction state detection circuit. 4,298,810, Cl. 307-252.00N.

Dishal, Milton, to International Telephone and Telegraph Corporation. Signal envelope detecting system. 4,298,841, Cl. 328-117.000.

Distler, Dieter; Mueller, Margarete; Bubam, Hans-Georg; and Addicks, Guenther, to BASF Aktiengesellschaft. Binder for paper-coating compositions. 4,298,513, Cl. 260-29.70H.

Dixie-Narco, Inc.: *See*—
Oden, Kenneth W., 4,298,138, Cl. 221-115.000.

Djukastein, Klaus, to Deroker Equipment Ltd. Rock separator. 4,298,464, Cl. 209-310.000.

Dobelle, William H.: *See*—
Ronel, Samuel H.; D'Andrea, Mark J.; Dobelle, William H.; Klomp, Gregory F.; and Hashiguchi, Hiroshi, 4,298,002, Cl. 128-260.000.

Dobyns, Thomas R.; Lindstrom, Richard R.; and Ridings, Robert P., to Communications Satellite Corporation. Decoding TIM bus structure. 4,298,979, Cl. 370-104.000.

Dockner, Toni; Kempe, Uwe; Krug, Herbert; Magnussen, Peter; Praetorius, Werner; and Szymanski, Hans J., to BASF Aktiengesellschaft. Preparation of 2-imidazolines. 4,298,748, Cl. 548-347.000.

Dr. Ing. h.c.F. Porsche AG: *See*—
Soffge, Friedhelm; and Weigele, Hans, 4,297,759, Cl. 14-2.600.

Doi, Yoshikazu; Uchida, Takaaki; and Sakai, Yutaka, to Fuji Photo Optical Co., Ltd. Rear stop type lens system. 4,298,252, Cl. 350-470.000.

Dominion Engineering Works Limited: *See*—
Shaver, Marvin B.; Vadas, Robert M.; and Stock, Norman A., 4,298,113, Cl. 192-0.094.

Dompas, John; and Petry, Charles J., to Metallurgie Hoboken-Overpelt. Casting belts for machines for the continuous casting of metals. 4,298,053, Cl. 164-429.000.

Domtar Inc.: *See*—
Limonchik, Abe; and Richardson, Neil G., 4,298,396, Cl. 106-273.00R.
Donohoe, Anthony J.: *See*—
Farrell, James J.; and Donohoe, Anthony J., 4,297,813, Cl. 52-2.000.
Donovan, William F., to United States of America, Army. Projectile. 4,297,948, Cl. 102-473.000.
Dorawala, Tansukhlal G.; and Kerr, Edwin R., to Texaco Inc. Coal liquefaction. 4,298,452, Cl. 208-8.0LE.
Dorfeld, William G.; and Settzo, Robert J., to Corning Glass Works. Resistor composition and method of manufacture thereof. 4,298,505, Cl. 252-513.000.
Dorina Nahmaschinen GmbH: *See*—
Meier, Willi, 4,297,956, Cl. 112-158.00A.
Dorpmund, Heinz; and Oberpichler, Gerd, to Volkswagenwerk Aktiengesellschaft. Control system for an automatic vehicle transmission. 4,298,109, Cl. 192-0.044.
Douglas, Donald A.; Menashi, Jameel; and Rappas, Alkis S., to Cabot Corporation. Process for recovering chromium, vanadium, molybdenum and tungsten values from a feed material. 4,298,581, Cl. 423-58.000.
Douglas, Donald A.: *See*—
Menashi, Jameel; Rappas, Alkis S.; and Douglas, Donald A., 4,298,582, Cl. 423-58.000.
Douglas, George H.: *See*—
Condouris, George A.; Yelnosky, John; Riley, Richard L.; Won, Chong M.; Douglas, George H.; and Studt, William L., 4,298,608, Cl. 424-249.000.
Dow Chemical Company, The: *See*—
Bradford, Larry L.; Jordan, David R.; and Williams, Kenneth W., 4,298,557, Cl. 264-51.000.
Cook, Frank T.; and Prier, Donald G., 4,298,758, Cl. 560-240.000.
Ginter, Sally P.; Pawloski, Chester E.; and Stevens, Violete L., 4,298,709, Cl. 521-169.000.
Orillion, Michael T., 4,298,657, Cl. 428-416.000.
Pawloski, Chester E., 4,298,602, Cl. 424-200.000.
Dow Corning Corporation: *See*—
Baney, Ronald H.; and Gaul, John H., Jr., 4,298,558, Cl. 264-65.000.
Baney, Ronald H.; and Gaul, John H., Jr., 4,298,559, Cl. 264-65.000.
Dowbenko, Rostyslaw: *See*—
Schimmel, Karl F.; Seiner, Jerome A.; Dowbenko, Rostyslaw; and Christenson, Roger M., 4,298,511, Cl. 260-29.2TN.
Doyle, Ronald J.; Keller, Kenneth F.; and Schaefer, Robert L., to Research Corporation. Gonorrhea diagnostic test. 4,298,689, Cl. 435-34.000.
Dragerwerk Aktiengesellschaft: *See*—
Eckstein, Wolfgang; and Rabenecker, Horst, 4,298,010, Cl. 128-719.000.
Draloric Electronic GmbH: *See*—
Weigel, Helmut; and Wollenschlager, Werner, 4,298,902, Cl. 361-328.000.
Drechsler, Rudolph C.: *See*—
Abbott, Robert P.; Chow, Ming-Chwan; Cirillo, Anthony J.; Drechsler, Rudolph C.; and Horney, Lee F., II, 4,298,977, Cl. 370-62.000.
Dressell, Richard G., Jr.; and Heideman, Robert J., to Enertrols, Inc. Shock absorber. 4,298,101, Cl. 188-285.000.
Dresser Industries, Inc.: *See*—
Winsor, Jack O.; and Patrick, Dennis J., 4,298,076, Cl. 173-164.000.
Drexler, Jerome: *See*—
Bouldin, Eric W.; and Drexler, Jerome, 4,298,684, Cl. 430-616.000.
Drexler Technology Corporation: *See*—
Bouldin, Eric W.; and Drexler, Jerome, 4,298,684, Cl. 430-616.000.
Druffel, James B., to Racor Industries, Inc. Fuel filter and water separator apparatus. 4,298,465, Cl. 210-304.000.
Dudley, Robert H., to Reclamet, Inc. Air blade construction for chip wringer. 4,298,476, Cl. 210-373.000.
Duembgen, Gerd: *See*—
Engelbach, Heinz; Krabetz, Richard; Duembgen, Gerd; Willersinn, Carl-Heinz; and Beitelschmidt, Walter, 4,298,763, Cl. 568-479.000.
Dufner, Donald E. Bean harvester. 4,297,830, Cl. 56-13.600.
Dufour, Daniel L., to Monsanto Company. Styrenic tetrapolymer. 4,298,716, Cl. 526-65.000.
Duhaime, Michael L., to General Motors Corporation. Control valve mechanism for a power transmission. 4,298,105, Cl. 192-3.230.
Dunkers, Karl R. Apparatus for equalization of overflow water and urban runoff in receiving bodies of water. 4,298,471, Cl. 210-170.000.
Dunwald, Willi: *See*—
Lewalter, Jurgen; Rottmaier, Ludwig; Merten, Rudolf; Zecher, Wilfried; Dunwald, Willi; and Schulte, Bernhard, 4,298,515, Cl. 260-30.40N.
Du Pont de Nemours, E. I., and Company: *See*—
Collette, John W.; and Tullock, Charles W., 4,298,722, Cl. 526-348.600.
Copeland, Terry M., 4,298,447, Cl. 204-252.000.
Fitzgerald, Patrick H., 4,298,398, Cl. 106-288.00Q.
Keller, Charles T., 4,298,329, Cl. 425-382.00N.
Lepone, Gerald E., 4,298,613, Cl. 424-274.000.
Lindsey, Richard V., Jr.; and Prichard, William W., 4,298,531, Cl. 260-346.110.
McGill, Robert N., 4,298,546, Cl. 260-465.900.
McKeever, Mark R., 4,298,678, Cl. 430-281.000.
Seney, John S., 4,297,772, Cl. 28-257.000.
Sommerfeld, Eugene G.; and Noyes, Paul R., 4,298,724, Cl. 528-302.000.
Taylor, Barry E., 4,298,407, Cl. 148-24.000.
Yang, Hung H., 4,298,565, Cl. 264-181.000.
Dupont, Michel: *See*—
Malafosse, Jean; Girou, Andre; Olivier, Herve; and Dupont, Michel, 4,298,585, Cl. 423-279.000.
Dupressoir, Albert; and Salvat, Francois, to Thomson-CSF. Radiating source formed by a dipole excited by a waveguide and an electronically scanning antenna comprising such sources. 4,298,878, Cl. 343-795.000.
Duracell International Inc.: *See*—
Moses, Peter R., 4,298,663, Cl. 429-50.000.
Przybyla, Franciszek J.; and Rossler, Eleanor J., 4,298,506, Cl. 252-518.000.
Durand, Jean-Pierre; and Petroff, Nicole, to Institut Francais du Petrole. Process for manufacturing impregnated silicas and the use of these silicas for analysis or purification of industrial products. 4,298,472, Cl. 210-198.200.
Duvall, William S.; and English, William K., to Xerox Corporation. Data processing system with character sort apparatus. 4,298,957, Cl. 364-900.000.
Dwyer Instruments, Inc.: *See*—
Buchanan, Steven O.; and Phillips, James W., 4,297,889, Cl. 73-747.000.
Dykes, James R. Lock cover. 4,297,861, Cl. 70-55.000.
Dykman, Arkady S.: *See*—
Batalin, Oleg E.; Dykman, Arkady S.; Osadchenko, Alexandr I.; Balkhanova, Galina F.; Belgorodsky, Izrail M.; Nevstruev, Vladimir I.; Radionov, Valery A.; Tulchinsky, Eduard A.; Belyaev, Valentin M.; Smolin, Jury I.; Breiman, Mark I.; Orlyansky, Vitaly V.; Zhirnov, Nikolai Y.; Galibin, Nikolai V.; Troitsky, Adrian P.; and Kovalenko, Vladimir V., 4,298,503, Cl. 252-432.000.
Dynamics Research Corporation: *See*—
Thomas, Lowell E., 4,298,436, Cl. 204-15.000.
Dynapol: *See*—
Parkinson, Thomas M.; Brown, Joseph P.; and Wingard, Robert E., Jr., 4,298,595, Cl. 424-78.000.
Dynatech - UZ, Inc.: *See*—
Hoffman, Jerzy, 4,298,847, Cl. 333-105.000.
E Z Paintr Corporation: *See*—
Crysdale, Donald T., 4,297,762, Cl. 15-257.060.
Eagle-Picher Industries, Inc.: *See*—
Yates, George A., 4,298,073, Cl. 173-22.000.
Earl, T. Desmond, to Textron Inc. Airplane wing and undercarriage construction. 4,298,175, Cl. 244-13.000.
Earle, Roland D., to Prime Manufacturing Company. Methanol automotive fuel. 4,298,351, Cl. 44-53.000.
Eastman Kodak Company: *See*—
Bishop, John F., 4,298,682, Cl. 430-533.000.
DiFulvio, Anthony P.; and Smith, Michael R., 4,298,571, Cl. 422-65.000.
Lu, Chen-i, 4,298,650, Cl. 428-306.000.
Easton, Anthony, to National Solar Corporation. Solar collector device. 4,297,991, Cl. 126-448.000.
Eberst, Dale S.: *See*—
Stroup, John F.; Nypaver, Leonard P.; and Eberst, Dale S., 4,297,901, Cl. 73-862.530.
Eckstein, Wolfgang; and Rabenecker, Horst, to Dragerwerk Aktiengesellschaft. Breathing alcohol testing device. 4,298,010, Cl. 128-719.000.
Econ Scrap Shear Co.: *See*—
Lessard, Kenneth R., 4,297,931, Cl. 83-397.000.
Eder, Ulrich: *See*—
Neef, Gunter; Eder, Ulrich; Haffer, Gregor; and Sauer, Gerhard, 4,298,538, Cl. 260-397.400.
Edge, David J.: *See*—
Coxon, Andrew C.; Edge, David J.; and Lapper, Mark L. L., 4,298,491, Cl. 252-95.000.
Edo-Aire Mitchell: *See*—
Nixon, John M., 4,298,843, Cl. 330-9.000.
Edwards, John W.; and Smith, John W., to United States of America, National Aeronautics and Space Administration. Apparatus for damping operator induced oscillations of a controlled system. 4,298,833, Cl. 318-561.000.
Ehmann, William J.; and Johnson, Walter E., Jr., to SCM Corporation. Process for the oxidation of primary allylic and benzylic alcohols. 4,298,762, Cl. 568-433.000.
EIC Corporation: *See*—
Makrides, Alkis C., 4,298,584, Cl. 423-242.000.
Eichelberger, Charles W.; Thomas, Charles E.; and Wojnarowski, Robert J., to General Electric Company. Oven having a cavity heated by at least one monolithic integrated heat source. 4,298,789, Cl. 219-406.000.
Ekelund, Christer. Method and apparatus for applying warp threads to hand looms. 4,298,122, Cl. 206-389.000.
El Paso Polyolefins Company: *See*—
Allan, John L. H.; Finestone, Arnold B.; and Roderick, John J., 4,298,521, Cl. 260-45.90R.
Electroplating Engineers of Japan, Limited: *See*—
Ando, Masato; Yamamoto, Kenji; and Taniguchi, Kazuhiro, 4,298,446, Cl. 204-224.00R.
Elfgen, Gerd. Milling tool for a rotating milling cylinder. 4,298,233, Cl. 299-91.000.

Elias, William H., to Sangamo Weston, Inc. Capacitor and element therefor. 4,298,906, Cl. 361-433.000.
Elijah, Jerry D. Method and apparatus for braking torque amplifier. 4,298,106, Cl. 192-3.570.
Eljutin, Alexandr V.: *See—*
Bochkarev, Ellin P.; Prokopov, Igor V.; Eljutin, Alexandr V.; Belsky, Arkady A.; Baryshnikova, Svetlana M.; Nasyrov, Nail Z.; Novikov, Nikolai A.; Khairulin, Edige R.; Zvyagin, Mikhail S.; Abrjutin, Vladimir N.; Konstantinova, Ljubov I.; Ljubimova, Nina A.; and Gorbacheva, Nadezhda S., 4,298,380, Cl. 75-101.0BE.
Elkin, Itzhak: *See—*
Alper, Yekutiel; Elkin, Itzhak; Wolf, Itzhak; Mihai, Gabriel; and Antler, Aharon, 4,297,832, Cl. 56-328.00R.
Elliott Turbomachinery Limited: *See—*
Williams, Tecwyn L., 4,298,060, Cl. 165-169.000.
Ellis, Stafford M., to General Electric Company Limited, The. Electronic component cooling arrangements. 4,298,903, Cl. 361-386.000.
Elsie, Lawrence E.: *See—*
Krieger, Aaron J.; and Elsie, Lawrence E., 4,297,828, Cl. 53-282.000.
Eltra Corporation: *See—*
Kyte, Derek J.; Hansen, Walter I.; and Craig, Roderick I., 4,298,945, Cl. 364-523.000.
Emerson Electric Co.: *See—*
Gryn, Felix J., 4,297,895, Cl. 73-861.120.
May, George H., 4,297,896, Cl. 73-861.120.
Young, James E., 4,297,897, Cl. 73-861.120.
Emery, Maurice M., to Smith International, Inc. Circulation valve for in-hole motors. 4,298,077, Cl. 175-65.000.
EMI Limited: *See—*
Oliver, Colin C., 4,298,799, Cl. 250-445.00T.
Emmett, James R., to Northern Engineering Industries, Ltd. Regeneration of ion exchange materials. 4,298,696, Cl. 521-26.000.
EMX Controls, Inc.: *See—*
Corrado, Anthony P.; and Marchese, Vincent P., 4,298,181, Cl. 251-129.000.
Endo, Hisao: *See—*
Oi, Nobuhiro; Aoki, Bunya; Shinozaki, Teizo; Moro, Kanji; Matsunaga, Isao; Noto, Takao; Nebashi, Toshiyuki; Harada, Yusuke; Endo, Hisao; Kimura, Takao; Okazaki, Hiroshi; Ogawa, Haruki; and Shindo, Minoru, 4,298,605, Cl. 424-246.000.
Energy Detection Company: *See—*
Moffet, John N.; Moffet, John D.; and Ragsdill, David L., 4,298,572, Cl. 422-68.000.
Enertrols, Inc.: *See—*
Dressell, Richard G., Jr.; and Heideman, Robert J., 4,298,101, Cl. 188-285.000.
Engelbach, Heinz; Krabetz, Richard; Duembgen, Gerd; Willersinn, Carl-Heinz; and Beitelschmidt, Walter, to BASF Aktiengesellschaft. Preparation of $\alpha,\beta$-olefinically unsaturated aldehydes of 3 or 4 carbon atoms. 4,298,763, Cl. 568-479.000.
Engelsberger, Georg: *See—*
Schinabeck, Anton; Zeller, Norbert; Lindner, Tassilo; Engelsberger, Georg; and Riedle, Rudolf, 4,298,753, Cl. 556-415.000.
English Clays Lovering Pochin & Co., Ltd.: *See—*
Watson, James H. P.; and Jones, James P. B., 4,298,478, Cl. 210-695.000.
English Electric Valve Company: *See—*
Hendry, Eric D., 4,298,821, Cl. 313-477.00R.
English, George J.; Levin, Robert E.; and Fohl, Timothy, to GTE Products Corporation. Flashlamp disk containing internal reflectors. 4,298,908, Cl. 362-14.000.
English, William K.: *See—*
Duvall, William S.; and English, William K., 4,298,957, Cl. 364-900.000.
Ennis, Colin S.: *See—*
Laws, Derek R. J.; Bath, Nigel A.; Ennis, Colin S.; Pickett, John A.; and Wheldon, Alfred G., 4,298,626, Cl. 426-600.000.
Envirotronics: *See—*
Richardson, John G.; and Soldat, Robert W., 4,298,163, Cl. 236-46.00R.
Ephithite, Henry J., to Wilkinson Rubber Linatex Limited. Centrifuge. 4,298,161, Cl. 233-7.000.
Epper, Wolfgang; and Heckman, Wolfgang, to Klockner-Humboldt-Deutz AG. Solid sleeve worm centrifuge. 4,298,159, Cl. 233-7.000.
Erickson Tool Company: *See—*
Benjamin, Milton L.; and Miles, Wilbur N., 4,298,208, Cl. 279-91.000.
Ericson Manufacturing Company, The: *See—*
Mahnke, Earl A.; and Zoller, Christopher J., 4,298,864, Cl. 340-657.000.
Eriksson, Carl L.: *See—*
Grahn, Sven-Ake; Roland, Magnus A.; and Eriksson, Carl L., 4,297,911, Cl. 280-777.000.
Eriksson, Lars O. Device at unfoldable escape-ladder. 4,298,092, Cl. 182-70.000.
Eriksson, Lars O. Escape-ladder. 4,298,097, Cl. 182-198.000.
ESPE Fabrik pharmazeutischer Praparate GmbH: *See—*
Herold, Wolf-Dietrich, 4,298,806, Cl. 250-504.00H.
Espelage, Paul M.; and D'Atre, John D., to General Electric Company. Method and apparatus for operating a plurality of parallel coupled, arbitrarily loaded induction machines from a single controlled current inverter. 4,298,831, Cl. 318-112.000.
Essilor International, "Cie Generale d'Optique": *See—*
Tagnon, Luc A., 4,298,253, Cl. 351-17.000.
Etat Francais represente par le Delegue Ministeriel pour l'Armement: *See—*
Dejob, Roger M.; and Tardivon, Marcel P., 4,298,963, Cl. 367-4.000.
Etoh, Kunihiko; Ishigaki, Tamotsu; and Niwa, Kuniyuki, to Toyoda-Koki Kabushiki-Kaisha. Data transfer system for data exchange between two operation processors. 4,298,928, Cl. 364-200.000.
Euler, August H. L.; and Beziac, Gilbert F. A., to Societe Nationale Industrielle Aerospatiale. Method of manufacturing a helicopter rotor blade. 4,298,417, Cl. 156-228.000.
Evans, William P.; and Leger, Violeta Z., to Union Carbide Corporation. Cathode comprising the reaction product of $Bi_2O_3$ and $WO_3$. 4,298,665, Cl. 429-197.000.
Evertz, Egon; and Seybold, R., to Evertz, Egon. Method of repairing steelworks ingot moulds and cast-iron steelworks ingot mould. 4,298,180, Cl. 249-135.000.
Extel Corp.: *See—*
Marciniec, Edmund T., 4,298,786, Cl. 219-216.000.
Exxon Production Research Company: *See—*
Rickenbacker, James E., 4,298,969, Cl. 367-76.000.
Exxon Research and Engineering Company: *See—*
Aldridge, Clyde L.; and Bearden, Roby, Jr., 4,298,454, Cl. 208-10.000.
Oswald, Alexis A.; Jermansen, Torris G.; Westner, Andrew A.; and Huang, I-Der, 4,298,541, Cl. 260-429.00R.
Ezaki, Norio: *See—*
Amano, Shoichi; Miyadoh, Shinji; Takahashi, Saeko; Ezaki, Norio; Niwa, Tomizo; and Yamada, Yujiro, 4,298,599, Cl. 424-119.000.
Fahmy, Mohamed A. H.; and Fukuto, Tetsuo R., to University of California, The Regents of the. N-Alkylthio- and N-arylthiosulfinylcarbamate esters. 4,298,527, Cl. 260-340.50R.
Fahmy, Mohamed A. H.; and Fukuto, Tetsuo R., to University of California, Regents of. Symmetrical and asymmetrical sulfinyl-dicarbamates. 4,298,617, Cl. 424-298.000.
Fairchild Camera & Instrument Corp.: *See—*
Hingarh, Hemraj K., 4,298,402, Cl. 148-1.500.
Falcon, Wayne J., to Halliburton Services. Apparatus and method for protecting a transducer. 4,297,891, Cl. 73-756.000.
Farina, Peter R.; and Grattan, James A., to Union Carbide Corporation. Folic acid derivatives. 4,298,735, Cl. 544-257.000.
Farmers Pride Cheese, Inc.: *See—*
Peterson, Harold J., 4,298,618, Cl. 426-36.000.
Farmos-Yhtma OY: *See—*
Koskenniska, Lasse A., 4,298,539, Cl. 260-397.250.
Farrell, James J.; and Donohoe, Anthony J., to Cornell Research Foundation, Inc. Multiple layer insulation cover. 4,297,813, Cl. 52-2.000.
Faudi, Rudi: *See—*
Granholm, Carl; and Faudi, Rudi, 4,298,792, Cl. 235-375.000.
Favre, Nicolas, to Compagnie Industrielle Radioelectrique. Process for inspecting the physical state of a printed document and an installatin for putting the process into operation. 4,298,807, Cl. 250-562.000.
Feilchenfeld, Michal M., to Westinghouse Electric Corp. Digital video line delay circuit. 4,298,859, Cl. 340-146.30Z.
Fend, Fritz: *See—*
Stahl, Karl-Heinz; Fend, Fritz; and Stahl, Werner, 4,298,167, Cl. 239-129.000.
Fernstrom, John D.; and Sved, Alan F., to Massschusetts Institute of Technology. Process for reducing blood pressure in animals. 4,298,611, Cl. 424-261.000.
Fierro Esponja, S.A.: *See—*
MacKay, Patrick W., 4,298,190, Cl. 266-156.000.
Figuet, Jacques A.: *See—*
Depierre, Yves; Figuet, Jacques A.; and Lemercier, Guy, 4,298,431, Cl. 176-290.000.
Filer and Stowell Company, The: *See—*
Hansel, Sydney; and Baker, Thomas N., 4,298,044, Cl. 144-176.000.
Filipowicz, Edwin A., to Griffith-Hope Company. Adjustable holder. 4,298,126, Cl. 211-50.000.
Finestone, Arnold B.: *See—*
Allan, John L. H.; Finestone, Arnold B.; and Roderick, John J., 4,298,521, Cl. 260-45.90R.
Firestone Tire & Rubber Company, The: *See—*
Hergenrother, William L.; Schwarz, Richard A.; Ambrose, Richard J.; and Hayes, Robert A., 4,298,707, Cl. 521-95.000.
Fischer, Carlin P. Insulated gauge rod and method of making the same. 4,297,787, Cl. 33-144.000.
Fischer & Porter Co.: *See—*
Herzl, Peter J., 4,297,898, Cl. 73-861.220.
Fischer, Reinhold S.: *See—*
MacKenzie, Michael C.; and Fischer, Reinhold S., 4,298,312, Cl. 415-118.000.
Fischer, Rudolf, to Siemens Aktiengesellschaft. Programmable memory protection logic for microprocessor systems. 4,298,934, Cl. 364-200.000.
Fisher, Harold E.: *See—*
Butler, G. Theodore; Porter, Travis G.; and Fisher, Harold E., 4,298,337, Cl. 431-285.000.
Fitremann, Jean-Michel: *See—*
Colonna, Jean; Fitremann, Jean-Michel; Genin, Richard; and Sarda, Jean-Paul, 4,298,066, Cl. 166-300.000.
Fitzgerald, Patrick H., to Du Pont de Nemours, E. I., and Company. Process for converting premilled crude quinacridone to pigmentary form. 4,298,398, Cl. 106-288.00Q.
Flagg, Rodger H. Balance assist for rotating recreational devices. 4,298,197, Cl. 272-115.000.

Flannery, James E.; Stempin, John L.; and Wexell, Dale R., to Corning Glass Works. Fluorophosphate opal glasses. 4,298,390, Cl. 501-32.000.

Flechtner, Charles: *See—*
Herbelleau, Yves; and Flechtner, Charles, 4,298,046, Cl. 152-209.00R.

Floyd, Middleton B., Jr., to American Cyanamid Company. 15-Deoxy-16-hydroxy-16-(1'fluorovinyl) prostaglandins and derivatives. 4,298,754, Cl. 560-121.000.

Fluckiger, Peter; and Schefer, Kurt, to Rieter Machine Works, Ltd. Winding apparatus for endless filaments having an automatic bobbin tube changer. 4,298,171, Cl. 242-18.00A.

Fluegel, Dale A., to Phillips Petroleum Company. Method and apparatus for applying a regulated voltage. 4,298,939, Cl. 364-421.000.

FMC Corporation: *See—*
Berkowitz, Sidney, 4,298,764, Cl. 568-618.000.

Fochesato, Antonio. Noninflammable olefin fibers and method of producing same. 4,298,509, Cl. 260-29.1SB.

Foerster, Siegfried: *See—*
Krauth, Axel; Maier, Horst R.; Phlmann, Hans-Juergen; Foerster, Siegfried; and Kleeman, Manfred, 4,298,059, Cl. 165-166.000.

Fogg, James L., to Westinghouse Electric Corp. Leaf spring puller for nuclear fuel rods. 4,297,776, Cl. 29-252.000.

Fohl, Timothy: *See—*
English, George J.; Levin, Robert E.; and Fohl, Timothy, 4,298,908, Cl. 362-14.000.

Fontaine Industries, Inc.: *See—*
Tominaga, Hideo, 4,297,789, Cl. 33-298.000.

Ford, David M.: *See—*
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Ford Motor Company: *See—*
Bellis, Andrew G., 4,297,980, Cl. 123-438.000.
Mourray, Jack W., 4,298,193, Cl. 267-63.00R.
Myers, Richard A., 4,297,910, Cl. 74-473.00R.
Robins, Ronald F.; and Lindre, Jaan, 4,298,857, Cl. 340-52.00A.
Strikis, Guntis V., 4,298,316, Cl. 417-310.000.

Ford, William D.: *See—*
Tatterson, David F.; and Ford, William D., 4,298,459, Cl. 208-120.000.

Formica, Francis A.; and Izenberg, James B., to International Pigment Processing Corp. Process for salt grinding of pigments. 4,298,399, Cl. 106-309.000.

Fortuna, Jon A.: *See—*
Swengel, Robert C., Jr.; Fortuna, Jon A.; and Defibaugh, George R., 4,298,243, Cl. 339-276.00F.

Foschi, Sergio: *See—*
Borghi, Italo; Foschi, Sergio; and Galli, Paolo, 4,298,721, Cl. 526-348.000.

Fowler, Herbert H.: *See—*
Israel, Allan D.; and Fowler, Herbert H., 4,298,768, Cl. 136-202.000.

Foy, Philip W.: *See—*
Casey, Horace C., Jr.; Cho, Alfred Y.; and Foy, Philip W., 4,297,783, Cl. 29-578.000.

Frame, Robert R., to UOP Inc. Method of treating a sour petroleum distillate. 4,298,463, Cl. 208-189.000.

Francois, Daniel; and Glachet, Charles, to La Calhene. Master-slave mechanical manipulator with homothetic displacements. 4,298,300, Cl. 414-2.000.

Franklin Steel Company: *See—*
Sweeney, Lawrence J., 4,298,075, Cl. 173-129.000.
Sweeney, Lawrence J., 4,298,292, Cl. 404-10.000.

Franzen, Gustav, to Palitex Project Company GmbH. Yarn brake for a textile yarn processing machine. 4,297,834, Cl. 57-58.860.

Freche, Charles: *See—*
Lotteau, Jacques; Bruker, Jacques; and Freche, Charles, 4,298,210, Cl. 280-259.000.

Freilich, Alfred: *See—*
DeCristofaro, Nicholas J.; Freilich, Alfred; and Nathasingh, Davidson M., 4,298,409, Cl. 148-108.000.

Frick, John G., Jr.; and Harper, Robert J., Jr., to United States of America, Agriculture. Bis(dihydroxymethyloxoimidazolidinyl)alkanes. 4,298,747, Cl. 548-318.000.

Fried, Reinhard; Mayer, Andreas; and Perego, Ambrogio, to BBC Brown, Boveri & Company Limited. Starting valve and mounting therefor. 4,298,028, Cl. 137-868.000.

Friedman, Harvey S., to Polaroid Corporation. Processing roller cleaner. 4,298,267, Cl. 354-304.000.

Fringeli, Werner: *See—*
Lange, Burkhart; Agarwal, Suresh C.; Fringeli, Werner; and Gunter, Franz, 4,298,490, Cl. 252-91.000.

Frischmann, Peter G.: *See—*
Liebermann, Howard H.; Frischmann, Peter G.; and Rosenberry, George M., Jr., 4,298,659, Cl. 428-592.000.

Froberg, Magnus L.; and Schroeder, Charles F., to Owens-Corning Fiberglas Corporation. Glass manufacturing process having boron and fluorine pollution abating features. 4,298,369, Cl. 65-27.000.

Frost, Charles C.; and Weis, Siegfried K., to C. L. Frost & Son, Inc. Method for making chain bracket with strengthened chain supports. 4,297,959, Cl. 113-116.0HH.

Frost, Rodney I., to Corning Glass Works. Extrusion apparatus for preventing the distortion of peripheral cells in extruded honeycomb structures. 4,298,328, Cl. 425-376.00A.

Fuji Oil Company, Ltd.: *See—*
Nagata, Toshiyuki; Terashima, Masahiko; and Mashima, Kazuto, 4,298,628, Cl. 426-656.000.

Fuji Photo Film Co., Ltd.: *See—*
Kubotera, Kikuo; Mizuki, Eiichi; Satomura, Masato; Iwano, Haruhiko; and Fujiwara, Tadahiro, 4,298,673, Cl. 430-204.000.
Shinozaki, Fumiaki; Washigawa, Yasuo; Ikeda, Tomoaki; Nakao, Sho; and Kondoh, Syunichi, 4,298,679, Cl. 430-281.000.
Takagi, Yoshihiro; and Sakai, Masakado, 4,298,677, Cl. 430-244.000.

Fuji Photo Optical Co., Ltd.: *See—*
Doi, Yoshikazu; Uchida, Takaaki; and Sakai, Yutaka, 4,298,252, Cl. 350-470.000.

Fuji Xerox Co., Ltd.: *See—*
Arai, Yoshio; Kataoka, Hiroyuki; Suzuki, Isao; and Yokota, Shozo, 4,298,895, Cl. 358-284.000.

Fujii, Hiromu: *See—*
Ohashi, Tetsro; Kitamura, Osamu; Fujii, Hiromu; Mineyuki, Seizo; and Takeuchi, Eiichi, 4,298,050, Cl. 164-468.000.

Fujiki, Yasuhiro: *See—*
Suzuki, Kuzuhiko; Fujiki, Yasuhiro; Kitahori, Tojiro; and Takada, Akira, 4,298,652, Cl. 428-323.000.

Fujimori, Kuniaki; Suzuka, Teruo; Inoue, Yukio; and Aizawa, Shirou, to Nippon Mining Company, Limited. Process for processing sulfur-containing heavy oil. 4,298,460, Cl. 208-121.000.

Fujimori, Ryo: *See—*
Ida, Hideaki; and Fujimori, Ryo, 4,298,449, Cl. 204-299.00R.

Fujisawa Pharmaceutical Co., Ltd.: *See—*
Ueda, Ikuo; Takaya. Takao; Kobayashi, Masakazu; Masugi, Takashi; Takasugi, Hisashi; Kochi, Hiromu; and Kitaguchi, Tadashi, 4,298,529, Cl. 260-340.90R.

Fujishiro, Takeshi, to Nissan Motor Company, Limited. Device for detection of oxygen concentration in combustion gas. 4,298,573, Cl. 422-94.000.

Fujitsu Limited: *See—*
Hirano, Yutaka; Fukuden, Nobutoshi; and Saito, Toshiaki, 4,298,846, Cl. 333-32.000.
Hirano, Yutaka, 4,298,879, Cl. 357-22.000.
Ito, Takashi, 4,297,782, Cl. 29-571.000.
Nishihara, Mikio; Oda, Masahiro; and Tsuchimoto, Takamitsu, 4,298,770, Cl. 174-68.500.
Nozaki, Takao; Ito, Takashi; Arakawa, Hideki; Ishikawa, Hajime; and Shinoda, Masaichi, 4,298,629, Cl. 427-39.000.

Fujiwara, Tadahiro: *See—*
Kubotera, Kikuo; Mizuki, Eiichi; Satomura, Masato; Iwano, Haruhiko; and Fujiwara, Tadahiro, 4,298,673, Cl. 430-204.000.

Fukuda, Makoto, to Matsushita Electronics Corporation. Folded fluorescent lamp and socket. 4,298,822, Cl. 313-493.000.

Fukuda, Mitsuhisa: *See—*
Kaneko, Yutaka; and Fukuda, Mitsuhisa, 4,298,244, Cl. 350-3.780.

Fukuden, Nobutoshi: *See—*
Hirano, Yutaka; Fukuden, Nobutoshi; and Saito, Toshiaki, 4,298,846, Cl. 333-32.000.

Fukuto, Tetsuo R.: *See—*
Fahmy, Mohamed A. H.; and Fukuto, Tetsuo R., 4,298,527, Cl. 260-340.50R.
Fahmy, Mohamed A. H.; and Fukuto, Tetsuo R., 4,298,617, Cl. 424-298.000.

Funk, Larry J.; and Bluhm, Eugene A., to Nutting Truck and Caster Company. Tow truck. 4,297,950, Cl. 104-172.0BT.

Furst, Herbert: *See—*
Thyret, Helmut; Balwe, Thomas; Hanzalik, Josef; Furst, Herbert; and Bauer, Johann, 4,298,576, Cl. 422-135.000.

Furuhashi, Toshio, to Hitachi, Ltd. Method for controlling an internal combustion engine. 4,298,941, Cl. 364-431.000.

Furuoya, Itsuo: *See—*
Moriya, Koji; and Furuoya, Itsuo, 4,298,533, Cl. 260-346.750.

Futaba Denshi Kogyo K.K.: *See—*
Kawasaki, Kishio; and Kishino, Takao, 4,298,823, Cl. 313-497.000.

Futamura, Shoji: *See—*
Higuchi, Noboru; and Futamura, Shoji, 4,298,564, Cl. 264-177.00R.

Gabbay, Shlomo M., to Occidental Research Corporation. Use of aldehydes as embrittling agents for waste. 4,298,349, Cl. 44-1.00C.

Gaeddert, Melvin V., to Hesston Corporation. Crop pickup with outboard cam control. 4,297,833, Cl. 56-364.000.

Gafney, Harry D., to Research Foundation of the City University of New York. Producing long life disproportionation products from a photo redox agent useful as a reducing medium for water, and the like. 4,298,439, Cl. 204-157.10W.

Gakiya, Yoshiaki, to Clover Mfg. Co., Ltd. Hand device for making a bias tape. 4,298,148, Cl. 223-37.000.

Galcik, Anthony J.: *See—*
Guenthner, Russell W.; Circello, Joseph C.; and Galcik, Anthony J., 4,298,952, Cl. 364-786.000.

Galer, Herbert W., to United States Steel Corporation. Child-proof lid and pail arrangement. 4,298,132, Cl. 220-288.000.

Galibin, Nikolai V.: *See—*
Batalin, Oleg E.; Dykman, Arkady S.; Osadchenko, Alexandr I.; Balkhanova, Galina F.; Belgorodsky, Izrail M.; Nevstruev, Vladimir I.; Radionov, Valery A.; Tulchinsky, Eduard A.; Belyaev, Valentin M.; Smolin, Jury I.; Breiman, Mark I.; Orlyansky, Vitaly V.; Zhirnov, Nikolai Y.; Galibin, Nikolai V.; Troitsky, Adrian P.; and Kovalenko, Vladimir V., 4,298,503, Cl. 252-432.000.

Galleymore, Harry R.; James, Kenneth; Jones, Haydn F.; Bhardwaj, Chaman L.; Plant, James S., deceased; and by Plant, Aline P., administrator, to Talres Development (N.A.) N.V. Process for the production of a surfactant containing sucrose esters. 4,298,730, Cl. 536-119.000.

Galli, Ercole, to Mondial Piston - Dott. Galli Ercole & C. S.p.A. Device for improving the lubrication in a rotary coupling. 4,297,975, Cl. 123-193.00P.
Galli, Paolo: *See*—
Borghi, Italo; Foschi, Sergio; and Galli, Paolo, 4,298,721, Cl. 526-348.000.
Mayr, Adolfo; Galli, Paolo; Susa, Ermanno; Di Drusco, Giovanni; and Giachetti, Ettore, 4,298,718, Cl. 526-125.000.
Gallina, Denise. Multiple saucer sandwich cooking device. 4,297,941, Cl. 99-332.000.
Gallizia, Achille, to Societa' Pneumatici Pirelli. Equipment for the injection molding of motor vehicle tire treads. 4,298,321, Cl. 425-120.000.
Galvagni, John L., to AVX Corporation. Method of manufacturing a monolithic ceramic capacitor. 4,297,773, Cl. 29-25.420.
Gange, Robert A.: *See*—
Credelle, Thomas L.; and Gange, Robert A., 4,298,819, Cl. 313-422.000.
GAO Gesellschaft fur Automation und Organisation mbH: *See*—
Hoppe, Joachim; and Haghiri-Tehrani, Yahya, 4,298,158, Cl. 229-69.000.
Garbo, Paul W. Remote control having push-pull blade with captive rolling elements. 4,297,913, Cl. 74-501.00R.
Gardineer, Bayard: *See*—
Mezrich, Reuben S.; Vilkomerson, David H. R.; and Gardineer, Bayard, 4,298,009, Cl. 128-660.000.
Gardiner, Arthur L.: *See*—
Castillo, Tomas R.; and Gardiner, Arthur L., 4,297,939, Cl. 89-33.00L.
Garelick, Herbert J., to Garelick Mfg. Co. Locking mechanism for foldable walker. 4,298,016, Cl. 135-67.000.
Garelick Mfg. Co.: *See*—
Garelick, Herbert J., 4,298,016, Cl. 135-67.000.
Gartner, William J.; and Henke, Harry R., to Panlmatic Company. Water treatment system. 4,298,467, Cl. 210-96.100.
Gartner, William J. Water purification system. 4,298,475, Cl. 210-266.000.
Garza, Antonio M. Dishwasher. 4,298,015, Cl. 134-100.000.
Gates Rubber Company, The: *See*—
Redmond, John D., Jr., 4,298,343, Cl. 474-255.000.
Gattu, Narahari, to Harnischfeger Corporation. Movable support for rotatable extend/retract screw in telescopic crane boom. 4,298,128, Cl. 212-267.000.
Gaul, John H., Jr.: *See*—
Baney, Ronald H.; and Gaul, John H., Jr., 4,298,558, Cl. 264-65.000.
Baney, Ronald H.; and Gaul, John H., Jr., 4,298,559, Cl. 264-65.000.
Gauthier, Henry J., to Scovill Inc. Apparatus for attaching slide fastener elements to fabric. 4,297,954, Cl. 112-104.000.
Gava, Paolo: *See*—
Bozzo, Gian M.; Gava, Paolo; and Paruzzolo, Antonio, 4,298,295, Cl. 405-52.000.
Gellert, Dietrich W.: *See*—
Adolfsson, Rune F. R.; and Gellert, Dietrich W., 4,298,551, Cl. 261-121.00R.
General Dynamics: *See*—
Hujsak, Edward J., 4,298,178, Cl. 244-158.00R.
General Electric Company: *See*—
Berger, Eugene L., 4,297,880, Cl. 73-155.000.
Brooks, Robert B., 4,297,852, Cl. 62-153.000.
Dehli, Diane M., 4,297,853, Cl. 62-325.000.
Dinger, Edward H.; and Ritter, Allen M., 4,298,810, Cl. 307-252.00N.
Eichelberger, Charles W.; Thomas, Charles E.; and Wojnarowski, Robert J., 4,298,789, Cl. 219-406.000.
Espelage, Paul M.; and D'Atre, John D., 4,298,831, Cl. 318-112.000.
Gerhold, Bruce W.; and Wilkes, Colin, 4,297,842, Cl. 60-39.060.
Heitman, Christopher J.; and Schwehr, Gregory D., 4,298,801, Cl. 250-447.000.
Hirsch, Harold H.; and Jackson, Melvin R., 4,298,816, Cl. 313-330.000.
Hughes, William C., 4,298,986, Cl. 375-84.000.
Johnson, Peter D., 4,298,813, Cl. 313-229.000.
Kray, William D., 4,298,655, Cl. 428-412.000.
Lee, Gim F., Jr., 4,298,514, Cl. 260-29.1SB.
Liebermann, Howard H.; Frischmann, Peter G.; and Rosenberry, George M., Jr., 4,298,659, Cl. 428-592.000.
McCarty, William J.; and Ruark, Bruce L., 4,297,854, Cl. 62-325.000.
McCarty, William J.; and Ruark, Bruce L., 4,297,855, Cl. 62-325.000.
Olashaw, William F., 4,298,771, Cl. 174-71.00B.
Philp, Sanborn F., 4,298,853, Cl. 336-83.000.
Rampel, Guy, 4,298,667, Cl. 429-248.000.
Schroeter, Siegfried H.; and Olson, Daniel R., 4,298,632, Cl. 427-160.000.
Sugalski, Raymond K.; Hooke, John W.; and Pate, Paul E., 4,298,662, Cl. 429-50.000.
Toma, John W., 4,298,110, Cl. 192-48.400.
General Electric Company Limited, The: *See*—
Ellis, Stafford M., 4,298,903, Cl. 361-386.000.
General Foods Corporation: *See*—
Katz, Saul N.; and Proscia, George E., 4,298,736, Cl. 544-274.000.
Mehring, Jeffrey S.; Sayen, Ronald J.; Schara, Robert E.; Stocker, Charles T.; and Rodriguez, Juan G., 4,298,624, Cl. 426-532.000.
General Motors Corporation: *See*—
Clayton, Kenneth H.; Denniston, Charles D.; Guetersloh, Donald G.; and Hallmann, Melvin H., 4,298,342, Cl. 474-110.000.
Duhaime, Michael L., 4,298,105, Cl. 192-3.230.
General Signal Corporation: *See*—
Glidden, James L., 4,298,319, Cl. 418-132.000.
Genin, Richard: *See*—
Colonna, Jean; Fitremann, Jean-Michel; Genin, Richard; and Sarda, Jean-Paul, 4,298,066, Cl. 166-300.000.
Genini, Graziano, to Albatex AG. Shed forming device for looms. 4,298,031, Cl. 139-55.100.
Genjida, Fumihide; Kawakatsu, Kunio; and Ii, Motohiko, to Sanyo Chemical Industries, Ltd. Hydraulic fluid compositions comprising borate esters of oxyalkylated heterocyclic or alicyclic amines. 4,298,487, Cl. 252-75.000.
Genuit, Luther L., to Honeywell Information Systems Inc. Switching regulator circuit with phase shift subtraction. 4,298,924, Cl. 363-46.000.
Gerber Products Company: *See*—
Harter, Elton H., 4,297,792, Cl. 34-12.000.
Gerhardt, Werner; Wehle, Volker; Syldatk, Andreas; Rogall, Gabriele; Reiffert, Jurgen; and Conrad, Jens, to Henkel Kommanditgesellschaft auf Aktien. Method and composition for inhibiting corrosion of nonferrous metals in contact with water. 4,298,568, Cl. 422-16.000.
Gerhold, Bruce W.; and Wilkes, Colin, to General Electric Company. NOx suppressant stationary gas turbine combustor. 4,297,842, Cl. 60-39.060.
Germain, Alfred; and Bonamour du Tartre, Georges, to Union Siderurgique du nord et de l'est de la France ("USINOR"). Machines for cooling metal sheets or like products. 4,298,188, Cl. 266-114.000.
Gerst, Robert C.: *See*—
Counselor, Gary D.; Gerst, Robert C.; and Pennington, Reginald A., 4,298,049, Cl. 164-30.000.
Gervais, Michel: *See*—
Kapuscinski, Marek; and Gervais, Michel, 4,298,630, Cl. 427-44.000.
Geschka, Hugo-Werner; and Beitecke, Bernd, to LuK Lamellen und Kupplungsbau GmbH. Automatic towel dispenser. 4,297,859, Cl. 68-13.00R.
Giachetti, Ettore: *See*—
Mayr, Adolfo; Galli, Paolo; Susa, Ermanno; Di Drusco, Giovanni; and Giachetti, Ettore, 4,298,718, Cl. 526-125.000.
Giben Impianti S.p.A.: *See*—
Benuzzi, Gino, 4,297,928, Cl. 83-57.000.
Gilcher, Heinz, to American Standard Inc. Vital cross field transformer circuit arrangement for railroad signaling systems. 4,298,179, Cl. 246-34.00R.
Gillet, Roger: *See*—
Damiron, Rene; Gillet, Roger; Heuillard, Jean-Francois; and Ruelle, Gilbert, 4,298,812, Cl. 310-61.000.
Gimler, John R., to Hercules Incorporated. Solventless extrusion of double base propellant prepared by a slurry process. 4,298,552, Cl. 264-3.00B.
Ginter, Sally P.; Pawloski, Chester E.; and Stevens, Violete L., to Dow Chemical Company, The. Polyhydroxyl polyether compounds containing phosphorus and polymeric resins prepared therefrom. 4,298,709, Cl. 521-169.000.
Girard, Francois: *See*—
Bernard, Claude R.; Daigne, Bernard; and Girard, Francois, 4,298,797, Cl. 250-372.000.
Girou, Andre: *See*—
Malafosse, Jean; Girou, Andre; Olivier, Herve; and Dupont, Michel, 4,298,585, Cl. 423-279.000.
Giuffrida, Anthony J., to Ionics, Incorporated. Electrodialysis process for silica removal. 4,298,442, Cl. 204-180.00P.
Glachet, Charles: *See*—
Francois, Daniel; and Glachet, Charles, 4,298,300, Cl. 414-2.000.
Glass, Cecil A.; and Burns, Dallas D., to United States of America, Navy. Cloud detonator in surface-launched fuel-air explosive minefield clearance round. 4,297,949, Cl. 102-229.000.
Glass, Geoffrey M. Hollow plastic barricade. 4,298,186, Cl. 256-64.000.
Glatthorn, Raymond H.: *See*—
Schneider, Urban A.; Monley, Robert E.; Nelson, Robert L.; and Glatthorn, Raymond H., 4,298,783, Cl. 219-75.000.
Glaxo Group Limited: *See*—
Stables, Harry C., 4,298,732, Cl. 544-20.000.
Glidden, James L., to General Signal Corporation. Hydraulic gear pump or motor with floating wear plates, balance assembly, and unitary load bearing and alignment means. 4,298,319, Cl. 418-132.000.
Glock, Wilfried. Antilock-freezing device. 4,297,863, Cl. 70-395.000.
Gloor, Ernst; Kaufmann, Meinolph; and Kmetz, Allan R., to BBC Brown, Boveri & Company, Ltd. Electro-optical display having an improved reflector and method of making. 4,298,249, Cl. 350-338.000.
Gluck, Lewis; and Tannenbaum, Robin M. Automatic gel changer for a spotlight. 4,298,920, Cl. 362-281.000.
Godsey, James H., to Hercules Incorporated. Crosslinked smokeless propellants. 4,298,411, Cl. 149-19.400.
Goetz, Norbert; Himmele, Walter; and Hupfer, Leopold, to BASF Aktiengesellschaft. Preparation of cis-2,6-dimethylmorpholine. 4,298,733, Cl. 544-106.000.
Goff, James R.: *See*—
Spence, Adam M.; and Goff, James R., 4,298,231, Cl. 299-50.000.
Goh, Atsushi: *See*—
Konno, Kazuhiko; Goh, Atsushi; and Sugaya, Kiyoshi, 4,298,740, Cl. 546-226.000.

Goldfarb, Adolph E.; and Dantzer, Elonne, to Goldfarb, Adolph E. Night light apparatus. 4,298,915, Cl. 362-124.000.

Goldman, Arnold, to Computome Corporation. Tomographic apparatus and method for obtaining three-dimensional information by radiation scanning. 4,298,800, Cl. 250-445.00T.

Golub, Allyn L., to Key Pharmaceuticals, Inc. Bandage containing attachment post. 4,297,995, Cl. 128-156.000.

Goodwin, Richard A.: *See—*
Upshaw, Clarence W.; and Goodwin, Richard A., 4,298,127, Cl. 211-126.000.

Gorbacheva, Nadezhda S.: *See—*
Bochkarev, Ellin P.; Prokopov, Igor V.; Eljutin, Alexandr V.; Belsky, Arkady A.; Baryshnikova, Svetlana M.; Nasyrov, Nail Z.; Novikov, Nikolai A.; Khairulin, Edige R.; Zvyagin, Mikhail S.; Abrjutin, Vladimir N.; Konstantinova, Ljubov I.; Ljubimova, Nina A.; and Gorbacheva, Nadezhda S., 4,298,380, Cl. 75-101.0BE.

Gorog, Sandor: *See—*
Jovanovics, Karola; and Gorog, Sandor, 4,298,525, Cl. 260-244.400.

Gottschalk, Robert E.; and Navarro, Felipe, to Panavision, Incorporated. Body harness for cinematographer. 4,298,149, Cl. 224-201.000.

Gottschalk, Robert E., to Panavision, Incorporated. Apparatus for preflashing motion picture film. 4,298,255, Cl. 352-85.000.

Gotz, Gerhard: *See—*
Bauer, Erwin; Davids, Ralf; Gotz, Gerhard; Jussen, Hilmar; Arndt, Heinrich; Kummel, Louis; Morhart, Rudolf; and Pollak-Banda, Erich, 4,297,917, Cl. 74-665.00G.

Gradassi, Michael J.: *See—*
Pellet, Regis J.; Gradassi, Michael J.; and Bertolacini, Ralph J., 4,298,461, Cl. 208-139.000.

Grahn, Sven-Ake; Roland, Magnus A.; and Eriksson, Carl L., to Saab-Scania Aktiebolag. Steering equipment arrangement for motor vehicles. 4,297,911, Cl. 280-777.000.

Grain Processing Corporation: *See—*
Armbruster, Frederick C., 4,298,400, Cl. 127-29.000.

Granholm, Carl; and Faudi, Rudi, to BSG-Schalttechnik GmbH & Co., K.G. Locking apparatus for preventing unauthorized access. 4,298,792, Cl. 235-375.000.

Graphic Technology, Inc.: *See—*
McCurdy, Frederic, 4,298,124, Cl. 206-455.000.

Gras, Gilbert: *See—*
Leveque, Jean-Luc; Rasseneur, Laurent; de Rigal, Jean P.; and Gras, Gilbert, 4,297,884, Cl. 73-579.000.

Grattan, James A.: *See—*
Farina, Peter R.; and Grattan, James A., 4,298,735, Cl. 544-257.000

Greene, Joseph L., to Richardson Chemical Company. Chromium-free or low-chromium metal surface passivation. 4,298,404, Cl. 148-6.14A.

Greenzweig, John E.: *See—*
Moulson, Thomas J.; and Greenzweig, John E., 4,298,711, Cl. 525-40.000.

Greer Hydraulics, Incorporated: *See—*
Zahid, Abduz, 4,298,029, Cl. 138-30.000.

Gregor, John A.; and Sellers, Gregory J., to Allied Chemical Corporation. Amorphous antipilferage marker. 4,298,862, Cl. 340-572.000.

Grib, James J.: *See—*
Lin, Wayne H. T.; Grib, James J.; and Mosier, Larry D., 4,298,592, Cl. 424-1.000.

Gribnau, Thomas: *See—*
Hildebrand, Dietrich; and Gribnau, Thomas, 4,298,395, Cl. 106-163.00R.

Grier, John D.: *See—*
Taylor, Lynn J.; and Grier, John D., 4,298,516, Cl. 260-31.80R.

Griffith, Gary L.; and Sherman, Charles J., to Bell Telephone Laboratories, Incorporated. Printed wiring board interconnection apparatus. 4,298,237, Cl. 339-17.00L.

Griffith-Hope Company: *See—*
Filipowicz, Edwin A., 4,298,126, Cl. 211-50.000.

Grillet, Jacques. Cable connector. 4,298,240, Cl. 339-109.000.

Gross, Jerome A.: *See—*
Hohenemser, Kurt H.; and Gross, Jerome A., 4,298,313, Cl. 416-98.000.

Grossoleil, Jacques: *See—*
Daniel, Jean-Claude; Grossoleil, Jacques; and Roullet, Robert, 4,298,637, Cl. 427-372.200.

Grovag Grossventiltechnik A.G.: *See—*
Squirrell, Anton F., 4,298,235, Cl. 308-26.000.

Groves, Malcolm D.: *See—*
Anthony, Andrew J.; and Groves, Malcolm D., 4,298,434, Cl. 376-364.000.

Groves, Michael R.; and Coulter, Wallace H., to Coulter Electronics, Inc. Particle shape determination. 4,298,836, Cl. 324-71.0CP.

Gruner, Garrett: *See—*
Tompson, Clement R.; and Gruner, Garrett, 4,298,943, Cl. 364-505.000.

Grunert, Wolfgang; Huber, Johann; and Rheindt, Kurt, to Knorr-Bremse GmbH. Valve seal for a pressure medium controlling valve. 4,298,184, Cl. 251-357.000.

Gryn, Felix J., to Emerson Electric Co. Field replaceable electrode assembly for magnetic flowmeter. 4,297,895, Cl. 73-861.120.

GTE Automatic Electric Labs Inc.: *See—*
Jusinskas, Julius, Jr., 4,298,774, Cl. 179-18.0BG.

GTE Products Corporation: *See—*
English, George J.; Levin, Robert E.; and Fohl, Timothy, 4,298,908, Cl. 362-14.000.
Powers, John A.; and Christini, James N., 4,298,485, Cl. 252-49.700.
Rowe, Don H., 4,298,835, Cl. 323-281.000.

Guellich, Fritz: *See—*
Sappok, Reinhard; Guellich, Fritz; Roth, Karl; and Wiesenberger, Alois, 4,298,526, Cl. 260-314.500.

Guenthner, Russell W.; Circello, Joseph C.; and Galcik, Anthony J., to Honeywell Information Systems Inc. One's complement adder. 4,298,952, Cl. 364-786.000.

Guetersloh, Donald G.: *See—*
Clayton, Kenneth H.; Denniston, Charles D.; Guetersloh, Donald G.; and Hallmann, Melvin H., 4,298,342, Cl. 474-110.000.

Gunter, Franz: *See—*
Lange, Burkhart; Agarwal, Suresh C.; Fringeli, Werner; and Gunter, Franz, 4,298,490, Cl. 252-91.000.

Gurney, Gerald W., to C. L. Frost & Son, Inc. Chain link and chain assembly including same. 4,297,839, Cl. 59-85.000.

Gurney, Gerald W.; and Lanham, William E., Jr., to C. L. Frost & Son, Inc. Chain link and chain assembly including same. 4,297,840, Cl. 59-85.000.

Gutehoffnungshutte Sterkrade AG: *See—*
Blotenberg, Wilfried, 4,298,310, Cl. 415-1.000.

Guthikonda, Ravindra N.: *See—*
Christensen, Burton G.; Guthikonda, Ravindra N.; and Ratcliffe, Ronald W., 4,298,741, Cl. 546-272.000.

Guthrie, David B.: *See—*
Cheng, William J.; and Guthrie, David B., 4,298,482, Cl. 252-25.000.

Gysegem, Albert P.: *See—*
Law, Gabriel H.; and Gysegem, Albert P., 4,298,543, Cl. 260-429.700.

H. Jack Flanders Co.: *See—*
Seffens, David E., 4,298,043, Cl. 144-136.00R.

Haberle, Fritz: *See—*
Raffelsiefer, Kurt; Kurth, Herman W.; and Haberle, Fritz, 4,298,223, Cl. 292-216.000.

Hadekel, Ruben. Gyroscopic vertical reference system. 4,297,905, Cl. 74-5.430.

Haemer, Laurence F.; and Kimak, Theodore, to Congoleum Corporation. Differential gloss products and methods of making the same. 4,298,646, Cl. 428-159.000.

Haffer, Gregor: *See—*
Neef, Gunter; Eder, Ulrich; Haffer, Gregor; and Sauer, Gerhard, 4,298,538, Cl. 260-397.400.

Hagemann, Hermann; Klauke, Erich; and Petruck, Gerd-Michael, to Bayer Aktiengesellschaft. Preparation of 4-nitrothioanisole. 4,298,761, Cl. 568-44.000.

Haggard, William J., to Chemed Corporation. Pumping process. 4,298,018, Cl. 137-3.000.

Haghiri-Tehrani, Yahya: *See—*
Hoppe, Joachim; and Haghiri-Tehrani, Yahya, 4,298,158, Cl. 229-69.000.

Hagiwara, Yoshihide, to Japan Natural Food Co. Ltd. Tear grass fermentation product, and process. 4,298,620, Cl. 426-44.000.

Hahn, Erwin: *See—*
Hoch, Helmut; Hahn, Erwin; and Hiller, Heinrich, 4,298,534, Cl. 260-358.000.

Hahn, Klaus; Hinselmann, Klaus; Halbritter, Klaus; Rebafka, Walter; and Weber, Heinz, to BASF Aktiengesellschaft. Process for the manufacture of flame retardant polystyrene foams. 4,298,702, Cl. 521-79.000.

Hainline, Truman D., to Tellus Machinery Corporation. Protective workplace and system. 4,297,940, Cl. 98-33.00R.

Hajdu, Johann; and Knauft, Guenter, to International Business Machines Corporation. LSI Circuitry conforming to level sensitive scan design (LSSD) rules and method of testing same. 4,298,980, Cl. 371-25.000.

Halbritter, Klaus: *See—*
Hahn, Klaus; Hinselmann, Klaus; Halbritter, Klaus; Rebafka, Walter; and Weber, Heinz, 4,298,702, Cl. 521-79.000.

Haldor Topsoe A/S: *See—*
Skov, Allan, 4,298,694, Cl. 518-704.000.

Halin, Yves R.; and LeLandais, Jacques R. A., to Societe Nationale d'etude et de Construction de Moteurs d'Aviation. Device for hydraulic control of thrust reversal for jet engine. 4,297,844, Cl. 60-226.00A.

Hall, Stanley R., to Bunker Ramo Corporation. Nth Root processing apparatus. 4,298,951, Cl. 364-752.000.

Halliburton Services: *See—*
Falcon, Wayne J., 4,297,891, Cl. 73-756.000.

Hallmann, Melvin H.: *See—*
Clayton, Kenneth H.; Denniston, Charles D.; Guetersloh, Donald G.; and Hallmann, Melvin H., 4,298,342, Cl. 474-110.000.

Hamano, Kuniyuki; and Ohta, Toshiyuki, to Nippon Electric Co., Ltd. Memory. 4,298,962, Cl. 365-182.000.

Hamano, Shin: *See—*
Hirai, Hiromu; and Hamano, Shin, 4,297,888, Cl. 73-664.000.

Hammel, Joseph J., to PPG Industries, Inc. Method of improving glass melting by ablation enhancement. 4,298,370, Cl. 65-27.000.

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Buck, Norman R.; and Hanson, David J., 4,298,775, Cl. 179-81.00R.
Hanson, Raymond A. Form handling system. 4,298,296, Cl. 405-146.000.
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Hardman, Harley F.; and Beach, Ronald I., to Standard Oil Company. Preparation of alcohols from synthesis gas. 4,298,354, Cl. 44-56.000.
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Litchfield, Leon G.; and Hardy, Terence, 4,298,234, Cl. 308-3.600.
Hargest, Thomas S., III; and Ryan, William C., Jr. Fluid flow connector unit and method. 4,298,001, Cl. 128-247.000.
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Harney, Robert C., to Massachusetts Institute of Technology. Infrared radar system. 4,298,280, Cl. 356-5.000.
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Gattu, Narahari, 4,298,128, Cl. 212-267.000.
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Harter, Elton H., to Gerber Products Company. Modified jar dryer. 4,297,792, Cl. 34-12.000.
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Hayase, Masahiro; Sugimoto, Hiroyuki; and Takemoto, Mitsuteru, to Shinagawa Refractories Co., Ltd. Hot repair gun refractory mix for a lining refractory. 4,298,391, Cl. 501-89.000.
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Haydt, Leo A., Jr., to Precision Tool & Machine, Inc. Apparatus for molding laminated foam-body panels. 4,298,323, Cl. 425-162.000.
Hayes, Derek. Multi-pin electrical plugs. 4,298,238, Cl. 339-63.00M.
Hayes, Robert A.: *See—*
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Headrick, Richard T., to Pichel Industries, Inc. Lighting device for creating public attraction. 4,298,911, Cl. 362-35.000.
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Arp, George F., 4,297,819, Cl. 52-293.000.
Hellstrom, Jerker, to Aktiebolaget IRO; and Aros Electronics AB. Method and apparatus for controlling a thread storage and feeder device. 4,298,172, Cl. 242-47.010.
Hendry, Eric D., to English Electric Valve Company. Electron tube with particle trap integral with envelope wall. 4,298,821, Cl. 313-477.00R.
Henery, Vern A., to PPG Industries, Inc. Apparatus for vaporizing solid coating reactants. 4,297,971, Cl. 118-719.000.
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Herbelleau, Yves; and Flechtner, Charles, to Compagnie Generale des Etablissements Michelin. Winter tire. 4,298,046, Cl. 152-209.00R.
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Godsey, James H., 4,298,411, Cl. 149-19.400.
Majewicz, Thomas G.; and Ropp, Walter S., 4,298,728, Cl. 536-96.000.
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Anders, Dietmar; and Dienst, Manfred, 4,298,322, Cl. 425-147.000.
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Muller, Helmuth; and Herrmann, Lother, 4,298,791, Cl. 235-132.00R.
Herzl, Peter J., to Fischer & Porter Co. Stabilized vortex-shedding flowmeter. 4,297,898, Cl. 73-861.220.
Heskett, Don E. Fluid treating apparatus. 4,298,468, Cl. 210-136.000.

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Teschner, Eckart; Sattelmeyer, Richard; and Hesse, Wolfgang, 4,298,356, Cl. 51-297.000.
Hesston Corporation: *See—*
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Higdon, Charles O. Jaw support for a power tongs. 4,297,922, Cl. 81-57.180.
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Higuchi, Toshiharu: *See—*
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Hildebrand, Dietrich; and Gribnau, Thomas, to Bayer Aktiengesellschaft. Activated polymeric carriers. 4,298,395, Cl. 106-163.00R.
Hill, Walter J., to British Steel Corporation. Defect detection. 4,298,808, Cl. 250-563.000.
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Hirai, Hiromu; and Hamano, Shin, to Hitachi, Ltd. Stability control system for vibration test device. 4,297,888, Cl. 73-664.000.
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Kudo, Mitsuhiro; Otomo, Shigekazu; Ogihara, Hirotomo; and Aoki, Yoshio, 4,298,381, Cl. 75-124.000.
Hitachi, Ltd.: *See—*
Daikoku, Takahiro; and Oguro, Tomokatsu, 4,298,825, Cl. 315-39.510.
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Hotta, Atsuo; and Kato, Yukio, 4,298,961, Cl. 365-179.000.
Nishizuka, Hiroshi; Komoriya, Susumu; Morita, Koyo; and Osakaya, Takayoshi, 4,298,273, Cl. 355-61.000.
Onda, Kenichi; and Amano, Hisao, 4,298,809, Cl. 307-252.00C.
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Sato, Isao; Kato, Fumio; Uchiyama, Yoshihiro; Iizuka, Nobuyuki; and Hata, Tsuneyuki, 4,297,843, Cl. 60-39.320.
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Yamamoto, Manabu; Murayama, Seiichi; Ito, Masaru; and Oishi, Kounosuke, 4,298,284, Cl. 356-368.000.
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Hoch, Helmut; Hahn, Erwin; and Hiller, Heinrich, to BASF Aktiengesellschaft. Preparation of brilliant, transparent pigmentary bromoisoviolanthrone of high tinctorial strength. 4,298,534, Cl. 260-358.000.
Hocutt, Hovan; and Ford, David M., to Pneumafil Corporation. Rotary drum filter stripper nozzle mounting. 4,298,361, Cl. 55-290.000.
Hodemaekers, Andreas M. L., to U.S. Philips Corporation. Liquid crystal display device having capacitance compensation. 4,298,866, Cl. 340-713.000.
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Hoeffken, Russell W., to Singer Company, The. Heat exchanger with crimped flange seam. 4,298,061, Cl. 165-170.000.
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Krenzer, Paul; Peters, Franz-Josef; Schlusnus, Karl-Heinz; and Wahl, Hans J., 4,298,785, Cl. 219-124.340.
Hoff, Stephen J., to Hoffco, Inc. Lawn mower blade rotation warning device. 4,297,829, Cl. 56-11.300.
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Hoff, Stephen J., 4,297,829, Cl. 56-11.300.
Hoffman, Jerzy, to Dynatech - UZ, Inc. Multiposition microwave switch with independent termination. 4,298,847, Cl. 333-105.000.
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Hohenemser, Kurt H.; and Gross, Jerome A. Horizontal axis wind generator having adaptive cyclic pitch control. 4,298,313, Cl. 416-98.000.
Hohne, Per, to Alfa-Laval Separation A/S. Decanter centrifuge. 4,298,162, Cl. 233-7.000.
Hok, Bertil, to Siemens Aktiengesellschaft. Pressure transducer. 4,297,890, Cl. 73-753.000.
Hollenbach, Gerald E.: *See—*
Cochran, Jerry R.; Insinger, Thomas H.; Hollenbach, Gerald E.; Piskorz, Ronald F.; and Smith, Addison M., 4,298,765, Cl. 568-754.000.
Hollenbeck, Arthur; and Petro, James, to Westinghouse Electric Corp. Method and apparatus for supplying filament coils to a mount machine. 4,298,136, Cl. 221-1.000.
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Loffler, Walter, 4,297,768, Cl. 19-113.000.
Holmes, James H. T.V. Energized by exercise cycle. 4,298,893, Cl. 358-190.000.
Holmstrand, Allan L.: *See—*
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Holstein and Kappert GmbH: *See—*
Knabe, Uwe; Sindermann, Siegmar; and Jordan, Heinrich, 4,298,039, Cl. 141-90.000.
Holt, Raymond B., Jr. Flash attachment with extendable head. 4,298,907, Cl. 362-4.000.
Holzer, Helmut; and von Arndt, Ernst M., to Carl Freudenberg, Firma. Two part shaft sealing ring. 4,298,203, Cl. 277-152.000.
Homola, Jaroslav; Remajzl, Karel; and Prokes, Milan, to CKD Praha, obrovy podnik. Multilayer semiconductor element. 4,298,882, Cl. 357-38.000.
Honda, Akira; Anzai, Takanori; Kitamura, Minoru; Ishikawa, Masaru; and Mizuoka, Seishi, to Nippon Kokan Kabushiki Kaisha. Discharging mechanism for molten metal and slag remaining in tundish for continuous casting machine. 4,298,147, Cl. 222-601.000.
Honda Giken Kogyo Kabushiki Kaisha: *See—*
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Honeywell Inc.: *See—*
Clark, Rodney L.; Kidder, Kenneth B.; and Peterson, Gary A., 4,298,334, Cl. 431-24.000.
Mills, Frank S., 4,298,855, Cl. 338-35.000.
Nelson, Lorne W., 4,298,056, Cl. 165-12.000.
Honeywell Information Systems Inc.: *See—*
Genuit, Luther L., 4,298,924, Cl. 363-46.000.
Guenthner, Russell W.; Circello, Joseph C.; and Galcik, Anthony J., 4,298,952, Cl. 364-786.000.
Lange, Ronald E.; and Koegel, Robert J., 4,298,935, Cl. 364-200.000.
Rathbun, Donald J.; and O'Keefe, David B., 4,298,956, Cl. 364-900.000.

Hood, John L. L., to British Cellophane Limited. Method and apparatus for the corona discharge treatment of webs, and webs treated therewith. 4,298,440, Cl. 204-165.000.
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Sugalski, Raymond K.; Hooke, John W.; and Pate, Paul E., 4,298,662, Cl. 429-50.000.
Hoppe, Joachim; and Haghiri-Tehrani, Yahya, to GAO Gesellschaft fur Automation und Organisation mbH. Packaging element for packaging sheet material. 4,298,158, Cl. 229-69.000.
Hopper, Chester S.; and Case, Edward M., to Marlo Company, Inc., The. Resilient gasket material. 4,298,207, Cl. 277-230.000.
Horie, Tatsuro: *See—*
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Horodysky, Andrew G.; and Kaminski, Joan M., to Mobil Oil Corporation. Nitrogen-containing products of phosphosulfurized esters and lubricants containing same. 4,298,484, Cl. 252-46.700.
Horodysky, Andrew G.; and Kaminski, Joan M., to Mobil Oil Corporation. Friction reducing additives and compositions thereof. 4,298,486, Cl. 252-49.600.
Horton, Edward E.; and Walker, Raymond W., to Deep Oil Technology, Inc. Tension leg structure for tension leg platform. 4,297,965, Cl. 114-265.000.
Horvath, William, to Plastic Research Products, Inc. Dispenser for stick solids. 4,298,036, Cl. 141-1.000.
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Saito, Masao; Hosokawa, Motoyuki; Kawakami, Takamasa; and Murayama, Yuko, 4,298,545, Cl. 260-465.00H.
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Hossom, Miles G., to American Home Products Corporation. Method for measuring and dispensing fractionary volumes of liquid samples. 4,298,035, Cl. 141-1.000.
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Allisbaugh, John H., 4,297,990, Cl. 126-445.000.
Howard, Alan N., to Technutra, S.A. Method and formulations for the treatment of obesity. 4,298,601, Cl. 424-128.000.
Howden, Ashley G.: *See—*
Jones, Lawrence T.; Sims, Anson; Howden, Ashley G.; Knighton, Mark S.; and Kingsbury, LC James, 4,298,788, Cl. 219-386.000.
Howe, Robert K.; and Lee, Len F., to Monsanto Company. 2-Substituted-5-phenyl-4-thiazolecarboxylic acids and their derivatives as safening agents. 4,298,375, Cl. 71-90.000.
Howells, Anthony P.; Diederich, Ronald E.; and Angehrn, Jorg A. Well logging correlation method and apparatus. 4,297,879, Cl. 73-152.000.
Howmedica International, Inc.-Zweigniederlassung, Kiel: *See—*
Harle, Anton, 4,297,993, Cl. 128-92.00D.
Huang, I-Der: *See—*
Oswald, Alexis A.; Jermansen, Torris G.; Westner, Andrew A.; and Huang, I-Der, 4,298,541, Cl. 260-429.00R.
Huang, Thomas L.; and Ling-Huang, Ling. Electronic game apparatus for a single player or opposing players. 4,298,198, Cl. 273-1.0GC.
Huang, Wann-Sheng, to Texaco Inc. Viscosity reduction process. 4,298,455, Cl. 208-48.0AA.
Huber, Johann: *See—*
Grunert, Wolfgang; Huber, Johann; and Rheindt, Kurt, 4,298,184, Cl. 251-357.000.
Hudrlik, Terrence R.: *See—*
Wright, Thomas C.; Hudrlik, Terrence R.; Mills, Perry A.; Rust, Robert C.; and Wallner, Thomas G., 4,298,007, Cl. 128-419.0PG.
Huffman, Fred N., to Thermo Electron Corporation. Method and apparatus for producing negative ions. 4,298,798, Cl. 250-423.00R.
Huggles & Meurer: *See—*
Vossen, Franz, 4,298,135, Cl. 220-371.000.
Hughes Aircraft Company: *See—*
Colles, Joseph H.; and Cooper, James E., Jr., 4,298,888, Cl. 358-140.000.
Rodgers, William E., 4,298,872, Cl. 343-100.0LE.
Hughes, William C., to General Electric Company. Receiver for phase-shift modulated carrier signals. 4,298,986, Cl. 375-84.000.
Hujii, Kunizo: *See—*
Terada, Sachio; Suhara, Akito; Shimada, Toshiro; Nakamura, Takashi; Hujii, Kunizo; and Nakahira, Nobuichi, 4,298,424, Cl. 156-668.000.
Hujsak, Edward J., to General Dynamics. Roving geosynchronous orbit satellite maintenance system. 4,298,178, Cl. 244-158.00R.
Hung, William M.: *See—*
Schmidt, Paul J.; and Hung, William M., 4,298,215, Cl. 282-27.500.
Hunsucker, Jerry H., to International Minerals & Chemical Corp. Coating composition of a polyamide and 2-nitro-2-hydroxymethyl-1,3-propanediol. 4,298,638, Cl. 427-385.500.
Hunter Douglas International, N.V.: *See—*
Rijnders, Willem, 4,297,822, Cl. 52-484.000.
Hunter, John J. Pipe sizing and grooving apparatus. 4,297,868, Cl. 72-402.000.
Hunter, Walter D., to Texaco Development Corporation. Secondary recovery process utilizing thickened water. 4,298,479, Cl. 252-8.55D.
Hunting Oilfield Services (U.K.) Limited: *See—*
McGugan, John D., 4,298,221, Cl. 285-328.000.
Hupf, Homer B.: *See—*
O'Brien, Harold A., Jr.; Hupf, Homer B.; and Wanek, Philip M., 4,298,591, Cl. 424-1.000.
Hupfer, Leopold: *See—*
Goetz, Norbert; Himmele, Walter; and Hupfer, Leopold, 4,298,733, Cl. 544-106.000.
Hurley, Patrick J.: *See—*
Barnes, Johnny G.; Hurley, Patrick J.; and Miller, Gary W., 4,298,290, Cl. 400-3.000.
Huron Chemicals Limited: *See—*
Casson, Harold V.; Crabtree, Grant G.; Kindl, Bruno; and Noonan, Edward B., 4,298,416, Cl. 156-87.000.
Hutchison, Wayne R., to Deere & Company. Brake-clutch interlock. 4,298,108, Cl. 192-13.00R.
Hwa, Stephen C. P., to Xerox Corporation. Development system. 4,297,972, Cl. 118-658.000.
Ida, Hideaki; and Fujimori, Ryo, to Olympus Optical Co., Ltd. Sample tray feeding apparatus. 4,298,449, Cl. 204-299.00R.
Ifrach, Abraham. Anti-theft motor fuel tank. 4,298,130, Cl. 220-20.000.
Iguera, Pierantonio: *See—*
Bruni, Ludovico; and Iguera, Pierantonio, 4,297,976, Cl. 123-193.0CP.
Ii, Motohiko: *See—*
Genjida, Fumihide; Kawakatsu, Kunio; and Ii, Motohiko, 4,298,487, Cl. 252-75.000.
Iida, Motoyori. Adapter for a container. 4,298,145, Cl. 222-478.000.
Iida, Takao; Shirahata, Kunikatsu; Ishii, Shinzo; Okachi, Ryo; and Nara, Takashi, to Kyowa Hakko Kogyo Co., Ltd. Antibiotics XK-62-3 and XK-62-4 and process for production thereof. 4,298,690, Cl. 435-80.000.
Iizuka, Nobuyuki: *See—*
Sato, Isao; Kato, Fumio; Uchiyama, Yoshihiro; Iizuka, Nobuyuki; and Hata, Tsuneyuki, 4,297,843, Cl. 60-39.320.
Ikeda, Kyoichi; and Ando, Motoyoshi, to Yokogawa Electric Works, Ltd. Vibration type transducer. 4,297,872, Cl. 73-32.00A.
Ikeda, Tomoaki: *See—*
Shinozaki, Fumiaki; Washigawa, Yasuo; Ikeda, Tomoaki; Nakao, Sho; and Kondoh, Syunichi, 4,298,679, Cl. 430-281.000.
Ikeno, Teruo; Kado, Satoshi; Ayusawa, Saburo; Kawasaki, Hironobu; and Watanabe, Takashi, to Nippon Steel Corporation. Surface treated steel materials. 4,298,661, Cl. 428-623.000.
Ilkcagla, Edward A. Dancing doll. 4,297,806, Cl. 46-1.00C.
Imai, Tamotsu, to UOP Inc. Recovery of catalysts. 4,298,499, Cl. 252-414.000.
Imamura, Akio; and Oya, Akiyoshi, to Nippon Gakki Seizo Kabushiki Kaisha. Display device for automatic rhythm performance apparatus. 4,297,934, Cl. 84-1.030.
Immuno Aktiengesellschaft fur chemisch-medizinische Produkte: *See—*
Schwarz, Otto; Linnau, Yendra; Loblich, Franz; and Seelich, Thomas, 4,298,598, Cl. 424-101.000.
Seidel, Dietrich; Wieland, Heinrich; and Molinari, Ewald, 4,298,441, Cl. 204-180.00G.
Imperial Chemical Industries Limited: *See—*
Cooper, John, 4,298,510, Cl. 260-29.20E.
Jones, Eirwyn; and Mitchell, Michael I., 4,297,947, Cl. 361-248.000.
Pinto, Alwyn, 4,298,588, Cl. 423-359.000.
Punja, Nazim; and Rathmell, William G., 4,298,616, Cl. 424-285.000.
Robinson, Graham E., 4,298,544, Cl. 260-453.0RW.
Inada, Masami; Kitamura, Kazuhiko; Ito, Shoji; Nonoyama, Takao; and Tsuji, Riichi, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kogyo Kabushiki Kaisha. Integrated valve device. 4,298,020, Cl. 137-315.000.
INCA Limited: *See—*
Tutty, Geoffrey C., 4,298,651, Cl. 428-307.000.
Industrial Technology Research Institute: *See—*
Chang, Ching-Te; and Su, Tsung-Tsan, 4,298,603, Cl. 424-230.000.
Industrie Pirelli S.p.A.: *See—*
Pirovano, Dante, 4,298,421, Cl. 156-460.000.
Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft: *See—*
Zimmer, Ernst, 4,297,908, Cl. 74-469.000.
Ingersoll-Rand Company: *See—*
Luthi, Oscar, 4,297,794, Cl. 34-122.000.
Inoue, Akihiko: *See—*
Masaki, Masaru; Ito, Yoshinori; Inoue, Akihiko; and Toda, Munetaka, 4,297,867, Cl. 72-347.000.
Inoue Gomu Kogyo Kabushiki Kaisha: *See—*
Katoh, Hisanori, 4,298,640, Cl. 428-31.000.
Inoue-Japax Research Incorporated: *See—*
Inoue, Kiyoshi, 4,298,781, Cl. 219-69.00W.
Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Wire-cut electroerosion machine and method of operating same. 4,298,781, Cl. 219-69.00W.
Inoue, Tadanori: *See—*
Sano, Takezo; Inoue, Tadanori; and Uemura, Yukikazu, 4,297,945, Cl. 101-395.000.
Inoue, Yukio: *See—*
Fujimori, Kuniaki; Suzuka, Teruo; Inoue, Yukio; and Aizawa, Shirou, 4,298,460, Cl. 208-121.000.

Insinger, Thomas H.: *See*—
Cochran, Jerry R.; Insinger, Thomas H.; Hollenbach, Gerald E.; Piskorz, Ronald F.; and Smith, Addison M., 4,298,765, Cl. 568-754.000.

Institut Francais du Petrole: *See*—
Colonna, Jean; Fitremann, Jean-Michel; Genin, Richard; and Sarda, Jean-Paul, 4,298,066, Cl. 166-300.000.
Durand, Jean-Pierre; and Petroff, Nicole, 4,298,472, Cl. 210-198.200.

Institut National de la Sante et de la Recherche Medicale (INSERM): *See*—
Nicolas, Jean C.; Terouanne, Beatrice; Descomps, Bernard; and De Paulet, Andre C., 4,298,686, Cl. 435-7.000.

Institute of Technology Precision Electrical Discharge Works: *See*—
Higuchi, Noboru; and Futamura, Shoji, 4,298,564, Cl. 264-177.00R.

Instrumentation Laboratory Inc.: *See*—
Ambers, Paul J., 4,298,026, Cl. 137-625.470.

Instruments S.A.: *See*—
Laude, Jean-Pierre, 4,298,845, Cl. 331-94.50C.

Insurance Technical Bureau, The: *See*—
Munday, George; Slater, David H.; Tyley, Leonard R. T.; Berenblut, Brian J.; and Whitehouse, Harry B., 4,298,955, Cl. 364-900.000.

Intercontrole S.A.: *See*—
Adamowski, Andrev, 4,298,054, Cl. 165-1.000.

International Business Machines Corporation: *See*—
Argumedo, Armando J.; Brock, George W.; and Losee, Paul D., 4,298,899, Cl. 360-122.000.
Arter, Nelson K.; Devore, Ernest W.; Wills, Arthur B.; and Zelenka, Leslie R., 4,298,897, Cl. 360-39.000.
Barnes, Johnny G.; Hurley, Patrick J.; and Miller, Gary W., 4,298,290, Cl. 400-3.000.
Berglund, Neil C.; Kempke, William G.; and Richardson, William C., 4,298,927, Cl. 364-200.000.
Bigelow, George A.; Rehage, Ted A.; and Shook, Frankie S., 4,298,954, Cl. 364-900.000.
Capozzi, Anthony J., 4,298,929, Cl. 364-200.000.
Hajdu, Johann; and Knauft, Guenter, 4,298,980, Cl. 371-25.000.
Makosch, Geunter; and Solf, Bernhard, 4,298,283, Cl. 356-351.000.
Nuez, Jean-Paul; and Lebesnerais, Gerard, 4,298,401, Cl. 148-1.500.
Sams, Jack G., 4,298,932, Cl. 364-200.000.

International Flavors & Fragrances Inc.: *See*—
Yoshida, Takao, 4,298,542, Cl. 260-429.00R.

International Harvester Company: *See*—
Klem, John E.; and Nelson, Daniel E., 4,297,914, Cl. 74-532.000.
Klem, John E., 4,297,915, Cl. 74-532.000.

International Minerals & Chemical Corp.: *See*—
Hunsucker, Jerry H., 4,298,638, Cl. 427-385.500.

International Pigment Processing Corp.: *See*—
Formica, Francis A.; and Izenberg, James B., 4,298,399, Cl. 106-309.000.

International Power Technology, Inc.: *See*—
Cheng, Dah Y., 4,297,841, Cl. 60-39.300.

International Telephone and Telegraph Corporation: *See*—
Dishal, Milton, 4,298,841, Cl. 328-117.000.
Naus, Hubert W.; and Bouvier, Alfred J., 4,298,566, Cl. 264-317.000.

Intex Products, Inc.: *See*—
Saus, J. Arthur; and McCartney, Larry P., 4,298,405, Cl. 148-6.15R.

Inventio AG: *See*—
Suss, Hans G.; and Kiml, Jiri, 4,298,100, Cl. 187-29.00R.

Ionics, Incorporated: *See*—
Giuffrida, Anthony J., 4,298,442, Cl. 204-180.00P.

Ippen, Joachim: *See*—
Staab, Heinz; and Ippen, Joachim, 4,298,751, Cl. 549-11.000.

IRD Mechanalysis, Inc.: *See*—
Davis, Dean T., 4,298,948, Cl. 364-603.000.

Irisova, Natalija: *See*—
Bielska-Lewandowska, Halina; Irisova, Natalija; Jung, Grzegorz; Lewandowski, Stanislaw J.; Prohorov, Aleksandr; Sobolewski, Roman; and Vinogradov, Eugenij, 4,298,990, Cl. 455-325.000.

Irvin, Ronald D.; Runyan, Steven R.; and Sherlock, Hugh P. Microphonograph record. 4,298,976, Cl. 369-282.000.

Isaacs, Harold. Merchandise order picking system and work table. 4,298,099, Cl. 186-58.000.

Ishibashi, Kazuhisa: *See*—
Ohmi, Hidehiko; and Ishibashi, Kazuhisa, 4,298,320, Cl. 425-110.000.

Ishigaki, Tamotsu: *See*—
Etoh, Kunihiko; Ishigaki, Tamotsu; and Niwa, Kuniyuki, 4,298,928, Cl. 364-200.000.

Ishihara, Theodore M.; and Kulkens, John F., to Zenith Radio Corporation. Cathode ray tube socket with controlled spark gaps. 4,298,815, Cl. 313-325.000.

Ishii, Haruo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Single-pivot type focal-plane shutter drum mechanism. 4,298,264, Cl. 354-242.000.

Ishii, Hideo: *See*—
Oide, Kunimasa; and Ishii, Hideo, 4,298,121, Cl. 206-347.000.

Ishii, Shinzo: *See*—
Iida, Takao; Shirahata, Kunikatsu; Ishii, Shinzo; Okachi, Ryo; and Nara, Takashi, 4,298,690, Cl. 435-80.000.

Ishikawa, Hajime: *See*—
Nozaki, Takao; Ito, Takashi; Arakawa, Hideki; Ishikawa, Hajime; and Shinoda, Masaichi, 4,298,629, Cl. 427-39.000.

Ishikawa, Masaru: *See*—
Honda, Akira; Anzai, Takanori; Kitamura, Minoru; Ishikawa, Masaru; and Mizuoka, Seishi, 4,298,147, Cl. 222-601.000.

Ishimaru, Kenji: *See*—
Nishikawa, Osamu; Ishimaru, Kenji; Takeshita, Toru; and Tsuruta, Hideki, 4,298,537, Cl. 260-397.200.

Ishimoto, Osamu: *See*—
Tsuda, Hiroshi; Miyashita, Kiyoshi; Kimura, Katsuhiko; Arima, Heihachi; and Ishimoto, Osamu, 4,298,276, Cl. 355-72.000.

Ishioka, Yozo: *See*—
Saiki, Yukihiro; Kumazawa, Eitaro; and Ishioka, Yozo, 4,297,793, Cl. 34-56.000.

Ishizuka, Shinichi; and Sugimoto, Kenji. Turret head for a lathe. 4,297,925, Cl. 82-2.00R.

Isobox-Barbier: *See*—
Soulier, Joel, 4,298,324, Cl. 425-174.80E.

Isowa, Eiichi, to Isowa Industry Co., Ltd. Device for spreading paste on paperboard in a corrugated board manufacturing apparatus. 4,297,968, Cl. 118-249.000.

Isowa Industry Co., Ltd.: *See*—
Isowa, Eiichi, 4,297,968, Cl. 118-249.000.

Israel, Allan D.; and Fowler, Herbert H. Cesium vapor thermionic current generator. 4,298,768, Cl. 136-202.000.

Isselmann, Piet H., to Akzona Incorporated. Accelerator for setting of cements. 4,298,392, Cl. 106-98.000.

Ito, Homu, to Takeda Chemical Industries, Ltd. Virus hemagglutination-inhibition reaction. 4,298,346, Cl. 23-230.00B.

Ito, Isao, to NGK Insulators, Ltd. Apparatus for measuring contour configuration of articles. 4,298,285, Cl. 356-376.000.

Ito, Masaru: *See*—
Yamamoto, Manabu; Murayama, Seiichi; Ito, Masaru; and Oishi, Kounosuke, 4,298,284, Cl. 356-368.000.

Ito, Ryoichi: *See*—
Tsunoda, Yoshito; Tatsuno, Kimio; Miyauchi, Toshimitsu; Aiki, Kunio; and Ito, Ryoichi, 4,298,974, Cl. 369-45.000.

Ito, Shoji: *See*—
Inada, Masami; Kitamura, Kazuhiko; Ito, Shoji; Nonoyama, Takao; and Tsuji, Riichi, 4,298,020, Cl. 137-315.000.

Ito, Takashi, to Fujitsu Limited. Method of manufacturing semiconductor devices. 4,297,782, Cl. 29-571.000.

Ito, Takashi: *See*—
Nozaki, Takao; Ito, Takashi; Arakawa, Hideki; Ishikawa, Hajime; and Shinoda, Masaichi, 4,298,629, Cl. 427-39.000.

Ito, Yoshinori: *See*—
Masaki, Masaru; Ito, Yoshinori; Inoue, Akihiko; and Toda, Munetaka, 4,297,867, Cl. 72-347.000.

ITT Industries, Inc.: *See*—
Vagman, Selmer, 4,297,784, Cl. 29-596.000.

Ivory, Dawn M., to Allied Corporation. Time-temperature indicator composition. 4,298,348, Cl. 23-230.00R.

Iwamura, Seishiro, to Mitsubishi Denki Kabushiki Kaisha. Reflection type screen. 4,298,246, Cl. 350-122.000.

Iwano, Haruhiko: *See*—
Kubotera, Kikuo; Mizuki, Eiichi; Satomura, Masato; Iwano, Haruhiko; and Fujiwara, Tadahiro, 4,298,673, Cl. 430-204.000.

Iwasa, Toshio: *See*—
Shimizu, Kunitoshi; Takamura, Masakazu; and Iwasa, Toshio, 4,298,644, Cl. 428-91.000.

Iwasaki, Hirokazu; and Takahashi, Hideo, to Showa Denko K.K. Process for production of 3-hydroxy-3-methylphthalide or the nuclearly substituted derivatives thereof. 4,298,530, Cl. 260-343.30R.

Iwasaki, Iwao, to University of Minnesota, The Regents of the. Selective flocculation, magnetic separation, and flotation of ores. 4,298,169, Cl. 241-16.000.

Izenberg, James B.: *See*—
Formica, Francis A.; and Izenberg, James B., 4,298,399, Cl. 106-309.000.

Izumi, Kaichi: *See*—
Ohba, Kenjiro; Izumi, Kaichi; and Yasuda, Shinichiro, 4,298,489, Cl. 252-78.500.

J. Aichelin: *See*—
Wunning, Joachim, 4,298,333, Cl. 431-11.000.

J. C. Schumacher Co.: *See*—
Schumacher, John C.; and Lagendijk, Andre, 4,298,037, Cl. 141-1.000.

J.G.L. Chemicals Ltd.: *See*—
Thankachan, Chacko; Ritchie, John G.; Sahayada, Eugene; and Sengupta, Asok, 4,298,658, Cl. 428-425.100.

Jac. Jacobsen A/S: *See*—
Krogsrud, Jens C.; and Soerensen, Kai O., 4,298,921, Cl. 362-346.000.

Jackson, Joseph F., to Thomas Broadbent & Sons Limited. Solid bowl decanter centrifuges. 4,298,160, Cl. 233-7.000.

Jackson, Melvin R.: *See*—
Hirsch, Harold H.; and Jackson, Melvin R., 4,298,816, Cl. 313-330.000.

Jackson, Ronald A.; and Maruscak, John, to Black & Decker Inc. Work support frame. 4,298,095, Cl. 182-184.000.

Jaco Manufacturing Company: *See*—
Davies, Irving W., 4,298,222, Cl. 285-341.000.

Jacobi, Manfred: *See*—
Lechtken, Peter; Buethe, Ingolf; Jacobi, Manfred; and Trimborn, Werner, 4,298,738, Cl. 546-22.000.

Jagenberg-Werke AG: *See*—
Zodrow, Rudolf, 4,298,422, Cl. 156-568.000.

James, Kenneth: *See*—
Galleymore, Harry R.; James, Kenneth; Jones, Haydn F.; Bhardwaj, Chaman L.; Plant, James S., deceased; and Plant, Aline P., administrator, 4,298,730, Cl. 536-119.000.

James, Robin H.; and Spooner, James A., to United Kingdom Atomic Energy Authority. Processes for reducing the oxygen content of metal oxides. 4,298,495, Cl. 252-643.000.

James, Ronald D.: *See*—
Samis, James M.; Waechter, Walter C.; and James, Ronald D., 4,298,621, Cl. 426-55.000.

Jamison, Merle A. Hitch pin. 4,298,212, Cl. 280-515.000.

Jansen, Heinz: *See*—
Russ, Peter; and Jansen, Heinz, 4,297,926, Cl. 82-9.000.

Janssen, Paul H. Fencing device. 4,298,185, Cl. 256-41.000.

Japan Natural Food Co. Ltd.: *See*—
Hagiwara, Yoshihide, 4,298,620, Cl. 426-44.000.

Japan Spectroscopic Co. Ltd: *See*—
Takeuchi, Tsugio; Tsuge, Shin; Hirata, Yukio; and Mochizuki, Koichi, 4,298,795, Cl. 250-282.000.

Jatkar, Arun D.: *See*—
Joshi, Ashok V.; Jatkar, Arun D.; and Sholette, William P., 4,298,664, Cl. 429-191.000.

Jelmax Co., Ltd.: *See*—
Kurose, Hideo, 4,298,848, Cl. 333-181.000.

Jenaer Glaswerk Schott & Gen.: *See*—
Sack, Werner, 4,298,388, Cl. 501-15.000.

Jennings, J. Thomas. Technique and device for measuring fluids including finger valve and filler mechanism. 4,298,038, Cl. 141-2.000.

Jermansen, Torris G.: *See*—
Oswald, Alexis A.; Jermansen, Torris G.; Westner, Andrew A.; and Huang, I-Der, 4,298,541, Cl. 260-429.00R.

Jerrold Electronics Corp.: *See*—
Dages, Charles L., 4,298,988, Cl. 455-182.000.

Jet Research Center, Inc.: *See*—
Regalbuto, John A.; and Christopher, Glenn B., 4,298,063, Cl. 166-55.000.

Jikahara, Tomo: *See*—
Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Tsutomu; Jikahara, Tomo; and Miyake, Toshiaki, 4,298,727, Cl. 536-10.000.

Jinkins, Danny R., to Black & Decker Inc. Seal. 4,298,204, Cl. 277-165.000.

Johansson, Kjell A. I. Apparatus for unwinding of a material web. 4,298,173, Cl. 242-58.000.

Johns-Manville Corporation: *See*—
Weinstein, Larry J., 4,297,893, Cl. 73-861.000.

Johnson, Curtiss S., Jr., to C. Sherman Johnson Company, Inc. Hinged deck cleat assembly. 4,297,962, Cl. 114-218.000.

Johnson, Fontain M., Jr., to Weaver Shipyard and Drydock, Inc. Outrigger-stabilized floating crane system. 4,297,961, Cl. 114-123.000.

Johnson, Lauren K.; and Thompson, David A., to Corning Glass Works. High transmission glasses for solar applications. 4,298,389, Cl. 501-77.000.

Johnson, Peter D., to General Electric Company. High intensity discharge lamps with uniform color. 4,298,813, Cl. 313-229.000.

Johnson, Raynor A.; and Barrow, Ralph M., Jr., to American Industrial Research. Flexible film air pallet for material movement. 4,298,083, Cl. 180-125.000.

Johnson, Robert A.: *See*—
Hennenfent, Douglas J.; Johnson, Robert A.; and Holmstrand, Allan L., 4,297,781, Cl. 29-467.000.

Johnson, Walter E., Jr.: *See*—
Ehmann, William J.; and Johnson, Walter E., Jr., 4,298,762, Cl. 568-433.000.

Johnston, Paul M., to Westinghouse Electric Corp. Programmable AC electric energy meter having radiation responsive external data interface. 4,298,839, Cl. 324-157.000.

Jones, Anthony E., to Brimec (U.K.) Limited. Vehicles with demountable bodies. 4,298,304, Cl. 414-492.000.

Jones, Eirwyn; and Mitchell, Michael I., to Imperial Chemical Industries Limited. Electric igniter. 4,297,947, Cl. 361-248.000.

Jones, Haydn F.: *See*—
Galleymore, Harry R.; James, Kenneth; Jones, Haydn F.; Bhardwaj, Chaman L.; Plant, James S., deceased; and Plant, Aline P., administrator, 4,298,730, Cl. 536-119.000.

Jones, James P. B.: *See*—
Watson, James H. P.; and Jones, James P. B., 4,298,478, Cl. 210-695.000.

Jones, Lawrence T.; Sims, Anson; Howden, Ashley G.; Knighton, Mark S.; and Kingsbury, LC James, to California R & D Center. Toy oven assembly. 4,298,788, Cl. 219-386.000.

Jones, Thomas P.: *See*—
Wright, Basil M.; and Jones, Thomas P., 4,297,871, Cl. 73-23.000.

Jordan, David R.: *See*—
Bradford, Larry L.; Jordan, David R.; and Williams, Kenneth W., 4,298,557, Cl. 264-51.000.

Jordan, Heinrich: *See*—
Knabe, Uwe; Sindermann, Siegmar; and Jordan, Heinrich, 4,298,039, Cl. 141-90.000.

Joshi, Ashok V.; Jatkar, Arun D.; and Sholette, William P., to Ray-O-Vac Corporation. Phosphorus-containing solid state electrolyte. 4,298,664, Cl. 429-191.000.

Jovanovics, Karola; and Gorog, Sandor, to Richter Gedeon Vegyeszeti Gyar RT. Bis-indole-alkaloid. 4,298,525, Cl. 260-244.400.

Joyce, John F., to National-Standard Company. Low viscosity composition for forming shaped bodies. 4,298,383, Cl. 75-211.000.

Jung, Grzegorz: *See*—
Bielska-Lewandowska, Halina; Irisova, Natalija; Jung, Grzegorz; Lewandowski, Stanislaw J.; Prohorov, Aleksandr; Sobolewski, Roman; and Vinogradov, Eugenij, 4,298,990, Cl. 455-325.000.

Jusinskas, Julius, Jr., to GTE Automatic Electric Labs Inc. Call waiting signal arrangement. 4,298,774, Cl. 179-18.0BG.

Jussen, Hilmar: *See*—
Bauer, Erwin; Davids, Ralf; Gotz, Gerhard; Jussen, Hilmar; Arndt, Heinrich; Kummel, Louis; Morhart, Rudolf; and Pollak-Banda, Erich, 4,297,917, Cl. 74-665.00G.

Justice, James W. H.; and Nahemow, Martin D., to Westinghouse Electric Corp. High frequency electrodeless lamp having a gapped magnetic core and method. 4,298,828, Cl. 315-248.000.

Kabushiki Kaisha Komatsu Seisakusho: *See*—
Nagai, Shunichi; and Higashi, Hidekazu, 4,298,114, Cl. 192-129.00A.

Kabushiki Kaisha Osaka Packing Seizosho: *See*—
Kubo, Kazuhiko; Takahashi, Akira; and Oohashi, Kenichi, 4,298,386, Cl. 501-80.000.

Kabushiki Kaisha Yakult Honsha: *See*—
Mutai, Masahiko; Mada, Mitsuo; and Shimada, Kiyohiro, 4,298,619, Cl. 426-43.000.

Kado, Satoshi: *See*—
Ikeno, Teruo; Kado, Satoshi; Ayusawa, Saburo; Kawasaki, Hironobu; and Watanabe, Takashi, 4,298,661, Cl. 428-623.000.

Kahn, Harvey R., to Alan I. Gerald Corporation. Firearm with interchangeable barrels and ammunition cylinders. 4,297,801, Cl. 42-59.000.

Kallies, Karl-Heinz, to Veb Arzneimittelwerk Dresden. Test device for the detection and determination of glucose. 4,298,688, Cl. 435-14.000.

Kaman Aerospace Corporation: *See*—
Bossler, Robert B., Jr.; and Hardersen, Charles P., 4,297,907, Cl. 74-417.000.

Kamibayashi, Tetsusaburo: *See*—
Kobayashi, Toshihiko; and Kamibayashi, Tetsusaburo, 4,298,772, Cl. 178-18.000.

Kaminski, Joan M.: *See*—
Horodysky, Andrew G.; and Kaminski, Joan M., 4,298,484, Cl. 252-46.700.
Horodysky, Andrew G.; and Kaminski, Joan M., 4,298,486, Cl. 252-49.600.

Kamleitner, Ewald, to Motoren- und Turbinen-Union Friedrichshafen GmbH. Split control rack. 4,297,979, Cl. 123-372.000.

Kanbar, Maurice S. Tangram game assembly. 4,298,200, Cl. 273-157.00R.

Kanbe, Junichiro: *See*—
Tajima, Hatsuo; Hosono, Nagao; and Kanbe, Junichiro, 4,297,970, Cl. 118-652.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Ueno, Takashi; and Nakamura, Kyoichi, 4,298,706, Cl. 521-92.000.

Kaneko, Fumihiko; Nitta, Koichi; and Saito, Kouichi, to Murata Manufacturing Co., Ltd. Chip-like electronic component series and method for supplying chip-like electronic components. 4,298,120, Cl. 206-329.000.

Kaneko, Yutaka; and Fukuda, Mitsuhisa, to Ricoh Company, Ltd. Information recording method and apparatus. 4,298,244, Cl. 350-3.780.

Kang, Kenneth S.: *See*—
Veeder, George T.; and Kang, Kenneth S., 4,298,691, Cl. 435-101.000.

Kanomata, Ichiro: *See*—
Suzuki, Keizo; Okudaira, Sadayuki; Nishimatsu, Shigeru; and Kanomata, Ichiro, 4,298,419, Cl. 156-345.000.

Kanzaki Paper Mfg. Co., Ltd.: *See*—
Suzuki, Kuzuhiko; Fujiki, Yasuhiro; Kitahori, Tojiro; and Takada, Akira, 4,298,652, Cl. 428-323.000.

Kao Soap Co., Ltd.: *See*—
Ohba, Kenjiro; Izumi, Kaichi; and Yasuda, Shinichiro, 4,298,489, Cl. 252-78.500.

Kapitany, Robert A.: *See*—
Acres, Stephen D.; and Kapitany, Robert A., 4,298,597, Cl. 424-92.000.

Kapur, Vijay K., to Atlantic Richfield Company. Silicon purification. 4,298,587, Cl. 423-350.000.

Kapuscinski, Marek; and Gervais, Michel, to Northern Telecom Ltd. Method of manufacturing electrically insulated conductors with ultra-violet cured coatings. 4,298,630, Cl. 427-44.000.

Karasawa, Yukinori, to Tokyo Kogaku Kikai Kabushiki Kaisha. Lamp house structure for illumination devices. 4,298,919, Cl. 362-226.000.

Kariya, Tadaaki: *See*—
Sakurada, Shuroku; Nakashima, Yoichi; Kojima, Isao; Yagi, Hideyuki; Kariya, Tadaaki; and Sugiyama, Masayoshi, 4,298,881, Cl. 357-38.000.

Karl Lautenschlager KG: *See*—
Lautenschlager, Reinhard, 4,297,763, Cl. 16-164.000.

Karl Mayer Textilmaschinenfabrik GmbH: *See*—
Blasberg, Helmar; and Wilkens, Christian, 4,297,858, Cl. 66-194.000.

Kashiwa, Norio: *See*—
Morita, Yoshinori; Toyota, Akinori; and Kashiwa, Norio, 4,298,713, Cl. 525-323.000.

Kassel, Karl-Heinz; Lutz, Manfred; Stuke, Josef; and Walsdorfer, Hubert, to Licentia Patent-Verwaltung-G.m.b.H. Tellurium layer allows vapor deposition of crystalline selenium thereon in making double layer electrophotographic record material. 4,298,671, Cl. 430-128.000.

Kasuga, Muneo: *See—*
Tsuda, Hiroshi; Miyashita, Kiyoshi; Nishikawa, Masaji; Shimizu, Akira; and Kasuga, Muneo, 4,298,270, Cl. 355-3.0SH.

Katakura, Hiroshi; and Tamura, Takashi, to Konishiroku Photo Industry Co., Ltd. Device for detachably attaching a master sheet to a drum. 4,298,278, Cl. 355-85.000.

Kataoka, Hiroyuki: *See—*
Arai, Yoshio; Kataoka, Hiroyuki; Suzuki, Isao; and Yokota, Shozo, 4,298,895, Cl. 358-284.000.

Kato, Fumio: *See—*
Sato, Isao; Kato, Fumio; Uchiyama, Yoshihiro; Iizuka, Nobuyuki; and Hata, Tsuneyuki, 4,297,843, Cl. 60-39.320.

Kato, Hironobu: *See—*
Tanaka, Etsuo; and Kato, Hironobu, 4,298,265, Cl. 354-246.000.

Kato, Yukio: *See—*
Hotta, Atsuo; and Kato, Yukio, 4,298,961, Cl. 365-179.000.

Katoh, Hisanori, to Inoue Gomu Kogyo Kabushiki Kaisha. Holdings for automobiles. 4,298,640, Cl. 428-31.000.

Katz, Saul N.; and Proscia, George E., to General Foods Corporation. Carbon-caffeine separation. 4,298,736, Cl. 544-274.000.

Katzer, Hans: *See—*
Kratel, Gunter; Katzer, Hans; Loskot, Stephan; Lang, Wilfried; and Weis, Klaus, 4,298,387, Cl. 501-92.000.

Kaufman, Kurt D., to Thomas C. Elder, Inc. 5'-Aminoalkyl-4',4-dialkylpsoralens. 4,298,614, Cl. 424-279.000.

Kaufmann, Frank H.; and Kramer, Charles F., to Steel Heddle Manufacturing Co. Shuttle grip. 4,298,032, Cl. 139-207.000.

Kaufmann, Meinolph: *See—*
Gloor, Ernst; Kaufmann, Meinolph; and Kmetz, Allan R., 4,298,249, Cl. 350-338.000.

Kawabata, Yasuhiro, to Aisin Seiki Kabushiki Kaisha. Air-fuel mixture control valve assembly. 4,297,984, Cl. 123-587.000.

Kawahara, Tsukasa: *See—*
Uchida, Mitsuo; Oguri, Yasuo; Saito, Junji; and Kawahara, Tsukasa, 4,298,561, Cl. 264-86.000.

Kawai, Kazuo; Yanagidaira, Hidetaka; and Tamori, Michitoshi, to Kokusai Denshin Denwa Kabushiki Kaisha. Automatic equalization system in FM communication circuit. 4,298,983, Cl. 375-12.000.

Kawakami, Takamasa: *See—*
Saito, Masao; Hosokawa, Motoyuki; Kawakami, Takamasa; and Murayama, Yuko, 4,298,545, Cl. 260-465.00H.

Kawakami, Youichi, to Mizue Kawakami. Water tap. 4,298,183, Cl. 251-263.000.

Kawakatsu, Kunio: *See—*
Genjida, Fumihide; Kawakatsu, Kunio; and Ii, Motohiko, 4,298,487, Cl. 252-75.000.

Kawakita, Kenji: *See—*
Ochiai, Michihiko; Okada, Taiiti; Aki, Osami; Morimoto, Akira; Kawakita, Kenji; and Matsushita, Yoshihiro, 4,298,606, Cl. 424-246.000.

Kawamura, Masaharu; Shigeta, Yoshihiro; Uchidoi, Masanori; Sugiura, Yoji; and Yamamoto, Hiroshi, to Canon Kabushiki Kaisha. Exposure control device for camera. 4,298,256, Cl. 354-23.00D.

Kawasaki, Hironobu: *See—*
Ikeno, Teruo; Kado, Satoshi; Ayusawa, Saburo; Kawasaki, Hironobu; and Watanabe, Takashi, 4,298,661, Cl. 428-623.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See—*
Murakami, Keikichi, 4,298,378, Cl. 75-60.000.
Shitamori, Mamoru, 4,298,211, Cl. 280-297.000.

Kawasaki, Kishio; and Kishino, Takao, to Futaba Denshi Kogyo K.K. Fluorescent display device. 4,298,823, Cl. 313-497.000.

Kawase, Kaoru; and Hayakawa, Kiyoshi, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Method for manufacture of ion-exchange graft membrane. 4,298,698, Cl. 521-27.000.

Keene Corporation: *See—*
Metcalf, Paul T., II, 4,298,918, Cl. 362-217.000.

Keinosuke Aida: *See—*
Nakagawa, Takeo, 4,298,660, Cl. 428-599.000.

Keisler, Carl E. Hollow wall repair device. 4,297,823, Cl. 52-514.000.

Kelderman, Hendrik C.: *See—*
Van Berkel, Johannes; and Kelderman, Hendrik C., 4,298,757, Cl. 560-231.000.

Kella, George; and Kella, Michael D. Interlocking construction block. 4,297,816, Cl. 52-125.000.

Kella, Michael D.: *See—*
Kella, George; and Kella, Michael D., 4,297,816, Cl. 52-125.000.

Keller, Charles T., to Du Pont de Nemours, E. I., and Company. Sizing mandrel for thermoplastic netting. 4,298,329, Cl. 425-382.00N.

Keller, Egon; and Kreutz, Peter, to Passavant-Werke Michelbacher Huette. Centrifugal separator having heat transfer means. 4,298,359, Cl. 55-269.000.

Keller, Jakob, to BBC Brown, Boveri & Company, Limited. Diffuser resonances. 4,298,088, Cl. 181-211.000.

Keller, Kenneth F.: *See—*
Doyle, Ronald J.; Keller, Kenneth F.; and Schaefer, Robert L., 4,298,689, Cl. 435-34.000.

Kelley Manufacturing Co.: *See—*
Whitfield, Carroll J.; and Lastinger, Anthony W., 4,298,071, Cl. 172-624.000.

Kelly, Frank M.: *See—*
Rumberger, Earl E.; and Kelly, Frank M., 4,297,778, Cl. 29-426.400.

Kelly, Robert C.; and Wierenga, Wendell, to Upjohn Company, The. Method for preparing (αS,5S)-α-amino-3-chloro-2-isoxazoline-5-acetic acid (AT-125) and analogs thereof. 4,298,744, Cl. 548-240.000.

Kelsey-Hayes Company: *See—*
Rozmus, Walter J., 4,298,168, Cl. 239-659.000.

Kempe, Uwe: *See—*
Dockner, Toni; Kempe, Uwe; Krug, Herbert; Magnussen, Peter; Praetorius, Werner; and Szymanski, Hans J., 4,298,748, Cl. 548-347.000.

Kempke, William G.: *See—*
Berglund, Neil C.; Kempke, William G.; and Richardson, William C., 4,298,927, Cl. 364-200.000.

Kendall, John H., to McDonnell Douglas Corporation. Remote refueling station. 4,298,176, Cl. 244-135.00A.

Kennedy, Peter D.; and Piesinger, Gregory H., to Motorola Inc. Desired signal estimator for null steerer FM reception using FSK modulation. 4,298,871, Cl. 343-100.0SA.

Keritsis, Gus D.: *See—*
Semp, Bernard A.; Teng, Daniel M.; and Keritsis, Gus D., 4,298,013, Cl. 131-308.000.

Kernforschungsanlage Juelich GmbH: *See—*
Krauth, Axel; Maier, Horst R.; Phlmann, Hans-Juergen; Foerster, Siegfried; and Kleeman, Manfred, 4,298,059, Cl. 165-166.000.

Kernforschungsanlage Julich GmbH: *See—*
Ashtheimer, Ludwig; Schenk, Hans-Joachim; and Schwochau, Klaus, 4,298,577, Cl. 423-6.000.

Kerr, Edwin R.: *See—*
Dorawala, Tansukhlal G.; and Kerr, Edwin R., 4,298,452, Cl. 208-8.0LE.

Kessel, Carl R.: *See—*
Dauben, William G.; Kessel, Carl R.; and Takemura, Kazuo H., 4,298,752, Cl. 549-42.000.

Ketterer, Stanley J., to Singer Company, The. Anti-haloing throat plate. 4,297,957, Cl. 112-184.000.

Key Pharmaceuticals, Inc.: *See—*
Golub, Allyn L., 4,297,995, Cl. 128-156.000.

Khairulin, Edige R.: *See—*
Bochkarev, Ellin P.; Prokopov, I$_k$or V.; Eljutin, Alexandr V.; Belsky, Arkady A.; Baryshnikova, Svetlana M.; Nasyrov, Nail Z.; Novikov, Nikolai A.; Khairulin, Edige R.; Zvyagin, Mikhail S.; Abrjutin, Vladimir N.; Konstantinova, Ljubov I.; Ljubimova, Nina A.; and Gorbacheva, Nadezhda S., 4,298,380, Cl. 75-101.0BE.

Kidder, Kenneth B.: *See—*
Clark, Rodney L.; Kidder, Kenneth B.; and Peterson, Gary A., 4,298,334, Cl. 431-24.000.

Kiehs, Karl: *See—*
Schwarz, Gerd-Ulrich; Kiehs, Karl; Boell, Walter; and Adolphi, Heinrich, 4,298,615, Cl. 424-285.000.

Kienzle Apparate GmbH: *See—*
Muller, Helmuth; and Herrmann, Lother, 4,298,791, Cl. 235-132.00R.

Kihlberg, Yngve R.; and Sjoholm, Johan E. P., to Kommanditbolaget United Stirling AB & CO. Tubular heat-exchanger. 4,298,057, Cl. 165-159.000.

Kim, Hong Z.: *See—*
Bulloch, David K.; and Kim, Hong Z., 4,298,681, Cl. 430-466.000.

Kimak, Theodore: *See—*
Haemer, Laurence F.; and Kimak, Theodore, 4,298,646, Cl. 428-159.000.

Kimata, Kei; Yasuda, Yoshinobu; Yoshida, Isamu; and Saruta, Masahiro, to NTN Toyo Bearing Company, Limited. Fuel flow rate measuring device. 4,297,981, Cl. 123-454.000.

Kimberly-Clark Corporation: *See—*
Meitner, Gary H., 4,298,649, Cl. 428-198.000.
Schmidt, George F.; and Weber, Robert E., 4,298,668, Cl. 429-250.000.

Kiml, Jiri: *See—*
Suss, Hans G.; and Kiml, Jiri, 4,298,100, Cl. 187-29.00R.

Kimura, Katsuhiko: *See—*
Tsuda, Hiroshi; Miyashita, Kiyoshi; Kimura, Katsuhiko; Arima, Heihachi; and Ishimoto, Osamu, 4,298,276, Cl. 355-72.000.

Kimura, Takao: *See—*
Oi, Nobuhiro; Aoki, Bunya; Shinozaki, Teizo; Moro, Kanji; Matsunaga, Isao; Noto, Takao; Nebashi, Toshiyuki; Harada, Yusuke; Endo, Hisao; Kimura, Takao; Okazaki, Hiroshi; Ogawa, Haruki; and Shindo, Minoru, 4,298,605, Cl. 424-246.000.

Kindl, Bruno: *See—*
Casson, Harold V.; Crabtree, Grant G.; Kindl, Bruno; and Noonan, Edward B., 4,298,416, Cl. 156-87.000.

Kinetico, Inc.: *See—*
Prior, William C.; and Brown, Keith E., 4,298,025, Cl. 137-624.140.

Kinevsky, Valery N.: *See—*
Avdeenko, Boris K.; Bronfman, Aron I.; Vitkin, Alexandr L.; Zelentsov, Boris N.; Kinevsky, Valery N.; and Rozet, Vladimir E., 4,298,900, Cl. 361-127.000.

Kingsbury, LC James: *See—*
Jones, Lawrence T.; Sims, Anson; Howden, Ashley G.; Knighton, Mark S.; and Kingsbury, LC James, 4,298,788, Cl. 219-386.000.

Kinnander, Bo; Landa, Torstein; and Mansson, Ragnar, to AB Asea Atom. Means for supplying feed water to a substantially cylindrical, vertical reactor tank. 4,298,433, Cl. 376-286.000.

Kirby, Archie D. Electronic tuning aid with digital readout. 4,297,938, Cl. 84-455.000.

Kircher, Morton S.: *See—*
Specht, Steven J.; and Kircher, Morton S., 4,297,923, Cl. 81-57.410.

Kishino, Takao: *See—*
Kawasaki, Kishio; and Kishino, Takao, 4,298,823, Cl. 313-497.000.

Kita, Toru: *See*—
Nagaishi, Hatsuo; and Kita, Toru, 4,297,894, Cl. 73-861.030.
Kitagawa, Masahiro, to Olympus Optical Company Ltd. Camera automatically synchronized with an electronic flash. 4,298,261, Cl. 354-139.000.
Kitaguchi, Tadashi: *See*—
Ueda, Ikuo; Takaya, Takao; Kobayashi, Masakazu; Masugi, Takashi; Takasugi, Hisashi; Kochi, Hiromu; and Kitaguchi, Tadashi, 4,298,529, Cl. 260-340.90R.
Kitahori, Tojiro: *See*—
Suzuki, Kuzuhiko; Fujiki, Yasuhiro; Kitahori, Tojiro; and Takada, Akira, 4,298,652, Cl. 428-323.000.
Kitamura, Kazuhiko: *See*—
Inada, Masami; Kitamura, Kazuhiko; Ito, Shoji; Nonoyama, Takao; and Tsuji, Riichi, 4,298,020, Cl. 137-315.000.
Kitamura, Minoru: *See*—
Honda, Akira; Anzai, Takanori; Kitamura, Minoru; Ishikawa, Masaru; and Mizuoka, Seishi, 4,298,147, Cl. 222-601.000.
Kitamura, Osamu: *See*—
Ohashi, Tetsro; Kitamura, Osamu; Fujii, Hiromu; Mineyuki, Seizo; and Takeuchi, Eiichi, 4,298,050, Cl. 164-468.000.
Kitani, Teruo: *See*—
Baba, Takaaki; Sagishima, Takayuki; Kitani, Teruo; and Sasaki, Reiichi, 4,298,891, Cl. 358-183.000.
Kitrell, John V. Portable resuscitation apparatus. 4,297,999, Cl. 128-205.160.
Kivits, Petrus J.: *See*—
van der Veen, Jan; Kivits, Petrus J.; and de Bont, Marinus R. J., 4,298,975, Cl. 369-94.000.
Klauke, Erich: *See*—
Hagemann, Hermann; Klauke, Erich; and Petruck, Gerd-Michael, 4,298,761, Cl. 568-44.000.
Kleeman, Manfred: *See*—
Krauth, Axel; Maier, Horst R.; Phlmann, Hans-Juergen; Foerster, Siegfried; and Kleeman, Manfred, 4,298,059, Cl. 165-166.000.
Klein, Theodore J.: *See*—
Ballard, Arthur H.; and Klein, Theodore J., 4,298,985, Cl. 375-82.000.
Kleine, Donald R.: *See*—
Wells, John J., Jr.; and Kleine, Donald R., 4,297,932, Cl. 83-581.100.
Klem, John E.; and Nelson, Daniel E., to International Harvester Company. Control lever gate with lever restraint. 4,297,914, Cl. 74-532.000.
Klem, John E., to International Harvester Company. Positive lever location maintenance trap. 4,297,915, Cl. 74-532.000.
Klockner-Humboldt-Deutz AG: *See*—
Brachthauser, Kunibert; and Herchenbach, Horst, 4,298,393, Cl. 106-100.000.
Epper, Wolfgang; and Heckman, Wolfgang, 4,298,159, Cl. 233-7.000.
Herchenbach, Horst; and Lechner, Bartl, 4,298,340, Cl. 432-58.000.
Klomp, Gregory F.: *See*—
Ronel, Samuel H.; D'Andrea, Mark J.; Dobelle, William H.; Klomp, Gregory F.; and Hashiguchi, Hiroshi, 4,298,002, Cl. 128-260.000.
Kmetz, Allan R.: *See*—
Gloor, Ernst; Kaufmann, Meinolph; and Kmetz, Allan R., 4,298,249, Cl. 350-338.000.
Knabe, Uwe; Sindermann, Siegmar; and Jordan, Heinrich, to Holstein and Kappert GmbH. Revolving container processing plant. 4,298,039, Cl. 141-90.000.
Knauft, Guenter: *See*—
Hajdu, Johann; and Knauft, Guenter, 4,298,980, Cl. 371-25.000.
Knell, Bernhard; and Rohrig, Adalbert, to Concast AG. Continuous casting installation containing open-ended mold. 4,298,052, Cl. 164-416.000.
Kness, Arnold A.: *See*—
Kness, Lester E.; Kness, Marvin E.; and Kness, Arnold A., 4,297,805, Cl. 43-83.500.
Kness, Lester E.; Kness, Marvin E.; and Kness, Arnold A., to Kness Manufacturing Co., Inc. Animal trap. 4,297,805, Cl. 43-83.500.
Kness Manufacturing Co., Inc.: *See*—
Kness, Lester E.; Kness, Marvin E.; and Kness, Arnold A., 4,297,805, Cl. 43-83.500.
Kness, Marvin E.: *See*—
Kness, Lester E.; Kness, Marvin E.; and Kness, Arnold A., 4,297,805, Cl. 43-83.500.
Knight, Peter R., to RCA Corporation. Horizontal deflection generator and driver circuit. 4,298,830, Cl. 315-411.000.
Knighton, Mark S.: *See*—
Jones, Lawrence T.; Sims, Anson; Howden, Ashley G.; Knighton, Mark S.; and Kingsbury, LC James, 4,298,788, Cl. 219-386.000.
Knopf, Herbert; Spahrkas, Heinrich; and Luck, Wolfhard, to Bayer Aktiengesellschaft. Age resistant chrome tanning agents. 4,298,344, Cl. 8-94.260.
Knorr-Bremse GmbH: *See*—
Grunert, Wolfgang; Huber, Johann; and Rheindt, Kurt, 4,298,184, Cl. 251-357.000.
Knoth, Werner D.; and Munker, Helmut. Process and apparatus for making hollow glassware. 4,298,371, Cl. 65-79.000.
Knowles, Albert H. Process and apparatus for increasing the utilization of fish feed in fish farming ponds and the like. 4,297,973, Cl. 119-3.000.
Knowles, Richard P., to Lucas Industries Limited. Electric starting aids for internal combustion engines. 4,297,785, Cl. 29-611.000.
Kobayashi, Akio: *See*—
Ohya, Masaki; Kobayashi, Akio; Ogiwara, Takeo; and Satake, Yoshikatsu, 4,298,710, Cl. 525-5.000.
Kobayashi, Koji: *See*—
Moroto, Shuzo; and Kobayashi, Koji, 4,298,085, Cl. 180-247.000.
Kobayashi, Masakazu: *See*—
Ueda, Ikuo; Takaya, Takao; Kobayashi, Masakazu; Masugi, Takashi; Takasugi, Hisashi; Kochi, Hiromu; and Kitaguchi, Tadashi, 4,298,529, Cl. 260-340.90R.
Kobayashi, Takuo; and Takashima, Yasuyuki, to Sandvik Conveyor GmbH. Apparatus for discharging articles from conveyor belts. 4,298,117, Cl. 198-367.000.
Kobayashi, Toshihiko; and Kamibayashi, Tetsusaburo, to Kokusai Denshin Denwa Kabushiki Kaisha. Coordinate reader using adjustable magnetostrictive oscillations. 4,298,772, Cl. 178-18.000.
Kobe Steel, Ltd.: *See*—
Narita, Kiichi; Mori, Takasuke; Ayata, Kenzo; and Makino, Takehisa, 4,298,376, Cl. 75-49.000.
Koch, Karl-Heinz: *See*—
Kuhn, Karl-Dieter; and Koch, Karl-Heinz, 4,298,579, Cl. 423-11.000.
Kochi, Hiromu: *See*—
Ueda, Ikuo; Takaya, Takao; Kobayashi, Masakazu; Masugi, Takashi; Takasugi, Hisashi; Kochi, Hiromu; and Kitaguchi, Tadashi, 4,298,529, Cl. 260-340.90R.
Koegel, Robert J.: *See*—
Lange, Ronald E.; and Koegel, Robert J., 4,298,935, Cl. 364-200.000.
Koenig, Philip C., to Boeing Company, The. Electronic conduction cooling clamp. 4,298,904, Cl. 361-386.000.
Koga, Keiichiro: *See*—
Morokawa, Shigeru; and Koga, Keiichiro, 4,298,971, Cl. 368-204.000.
Kogo, Hiroshi; Tonooka, Mamoru; Aoki, Teruhisa; Ando, Shigeo; and Tomiyama, Raiji, to Nissan Motor Company, Limited. Directivity display device and method. 4,298,965, Cl. 367-13.000.
Kojima, Isao: *See*—
Sakurada, Shuroku; Nakashima, Yoichi; Kojima, Isao; Yagi, Hideyuki; Kariya, Tadaaki; and Sugiyama, Masayoshi, 4,298,881, Cl. 357-38.000.
Kojima, Noriatsu. Flexible packing for sealing pipeline joints. 4,298,206, Cl. 277-205.000.
Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Kawai, Kazuo; Yanagidaira, Hidetaka; and Tamori, Michitoshi, 4,298,983, Cl. 375-12.000.
Kobayashi, Toshihiko; and Kamibayashi, Tetsusaburo, 4,298,772, Cl. 178-18.000.
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Boyama, Kimihiro, 4,297,977, Cl. 123-320.000.
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Lindre, Jaan: *See—*
Robins, Ronald F.; and Lindre, Jaan, 4,298,857, Cl. 340-52.00A.

Lindsey, Richard V., Jr.; and Prichard, William W., to Du Pont de Nemours, E. I., and Company. Oxidation of butadiene to furan. 4,298,531, Cl. 260-346.110.

Lindstrom, Richard R.: *See—*
Dobyns, Thomas R.; Lindstrom, Richard R.; and Ridings, Robert P., 4,298,979, Cl. 370-104.000.

Ling, Chung-Mei, to Abbott Laboratories. Reagents and methods utilizing labeled Fab bound to antigens. 4,298,593, Cl. 424-1.000.

Ling-Huang, Ling: *See—*
Huang, Thomas L.; and Ling-Huang, Ling, 4,298,198, Cl. 273-1.0GC.

Linnau, Yendra: *See—*
Schwarz, Otto; Linnau, Yendra; Loblich, Franz; and Seelich, Thomas, 4,298,598, Cl. 424-101.000.

Liqui-Box Corporation: *See—*
Schieser, Warren J.; and Vickers, Stanley E., 4,297,929, Cl. 83-110.000.

Litchfield, Leon G.; and Hardy, Terence, to L.B. (Plastics) Limited. Drawers and drawer components. 4,298,234, Cl. 308-3.600.

Little Giant Industries, Inc.: *See—*
Wing, Harold R., 4,298,093, Cl. 182-153.000.

Ljubimova, Nina A.: *See—*
Bochkarev, Ellin P.; Prokopov, Igor V.; Eljutin, Alexandr V.; Belsky, Arkady A.; Baryshnikova, Svetlana M.; Nasyrov, Nail Z.; Novikov, Nikolai A.; Khairulin, Edige R.; Zvyagin, Mikhail S.; Abrjutin, Vladimir N.; Konstantinova, Ljubov I.; Ljubimova, Nina A.; and Gorbacheva, Nadezhda S., 4,298,380, Cl. 75-101.0BE.

LKB Clinicon Aktiebolag: *See—*
Berglund, Erling, 4,298,575, Cl. 73-864.130.

Loblich, Franz: *See—*
Schwarz, Otto; Linnau, Yendra; Loblich, Franz; and Seelich, Thomas, 4,298,598, Cl. 424-101.000.

Loev, Bernard: *See—*
Brown, Richard E.; St. Georgiev, Vasil; and Loev, Bernard, 4,298,742, Cl. 548-152.000.

Loffler, Walter, to Hollingsworth GmbH. Carding plate. 4,297,768, Cl. 19-113.000.

Lohr, David: *See—*
Wang, Cheng L.; Soodak, Charles; and Lohr, David, 4,298,938, Cl. 364-413.000.

Long, Alvin L. Electric firing device. 4,298,914, Cl. 362-112.000.

Longyear Company: *See—*
Anderson, Ronald B.; Caneer, Clifford, Jr.; and Maki, Terrance C., 4,297,771, Cl. 24-263.0DA.

Loos, Evelyn J., to Weir, Stanley M. Garbage disposal utensil. 4,297,761, Cl. 15-105.000.

Lord, Henry A.: *See—*
Reifers, Richard F.; and Lord, Henry A., 4,298,156, Cl. 229-2.50R.

L'Oreal: *See—*
Leveque, Jean-Luc; Rasseneur, Laurent; de Rigal, Jean P.; and Gras, Gilbert, 4,297,884, Cl. 73-579.000.

Losee, Paul D.: *See—*
Argumedo, Armando J.; Brock, George W.; and Losee, Paul D., 4,298,899, Cl. 360-122.000.

Loskot, Stephan: *See—*
Kratel, Gunter; Katzer, Hans; Loskot, Stephan; Lang, Wilfried; and Weis, Klaus, 4,298,387, Cl. 501-92.000.

Lotteau, Jacques; Bruker, Jacques; and Freche, Charles. Device allowing a safety connection between the pedal of a bicycle and the shoe worn by the cyclist. 4,298,210, Cl. 280-259.000.

Lovell, Roger. Corrosion protection method. 4,298,635, Cl. 427-247.000.

Lozano, Raymond L.: *See—*
Yan, Tsoung-yuan; and Lozano, Raymond L., 4,298,578, Cl. 423-7.000.

Lozar, Michael J. Illuminating apparatus. 4,298,913, Cl. 362-103.000.

Lu, Chen-i, to Eastman Kodak Company. Phosphorescent screens. 4,298,650, Cl. 428-306.000.

Lu, Chin H., to Xerox Corporation. Toners containing alkyl pyridinium compounds and their hydrates. 4,298,672, Cl. 430-108.000.

Lucas Industries Limited: *See—*
Knowles, Richard P., 4,297,785, Cl. 29-611.000.
Lakra, Paul, 4,297,982, Cl. 123-502.000.

Luck, Wolfhard: *See—*
Knopf, Herbert; Spahrkas, Heinrich; and Luck, Wolfhard, 4,298,344, Cl. 8-94.260.

Ludwig, Christian. Interchangeable lens for cameras, such as reflex cameras. 4,298,266, Cl. 354-286.000.

LuK Lamellen und Kupplungsbau GmbH: *See—*
Geschka, Hugo-Werner; and Beitecke, Bernd, 4,297,859, Cl. 68-13.00R.

Luthi, Oscar, to Ingersoll-Rand Company. Paper sheet dryer. 4,297,794, Cl. 34-122.000.

Lutz, Manfred: *See—*
Kassel, Karl-Heinz; Lutz, Manfred; Stuke, Josef; and Walsdorfer, Hubert, 4,298,671, Cl. 430-128.000.

Lutz, Rainer M. Toilet and cover. 4,297,750, Cl. 4-247.000.

Luz, David W., to RCA Corporation. Power supply and deflection circuit with raster size compensation. 4,298,829, Cl. 315-408.000.

M. W. Kellogg Company, The: *See—*
LeBlanc, Joseph R.; and Peterson, Robert B., 4,298,589, Cl. 423-359.000.

Maag- Zahnrader & Maschinen AG: *See—*
Sterki, Armin; and Sommer, Gerd R., 4,297,788, Cl. 33-179.50R.

Maaghul, John, to PPG Industries, Inc. Method for producing an improved bundle of a plurality of fiber glass strands. 4,298,653, Cl. 428-378.000.

Mac Valves, Inc.: *See—*
Neff, James A., 4,298,027, Cl. 137-625.650.

Macharashvili, Petr G.: *See—*
Barbakadze, Dzhondo F.; Mindeli, Mamuka S.; Macharashvili, Petr G.; Rusidze, Vazha V.; and Suladze, Otari N., 4,298,192, Cl. 266-218.000.

Machon, Jean-Pierre, to Societe Chimique des Charbonnages-CdF Chimie. Ethylene polymerization process. 4,298,717, Cl. 526-124.000.

Machonis, John, Jr.; Schmukler, Seymour; Zeitlin, Robert J.; and Shida, Mitsuzo, to Chemplex Company. Adhesive blends of elastomer, polyolefin, and graft of polyethylene with unsaturated fused ring anhydrides. 4,298,712, Cl. 525-74.000.

MacKay, Patrick W., to Fierro Esponja, S.A. Apparatus for gaseous reduction of metal ores with cooling loop. 4,298,190, Cl. 266-156.000.

MacKenzie, Michael C.; and Fischer, Reinhold S., to Purex Corporation. Damaged vane locating method and apparatus. 4,298,312, Cl. 415-118.000.

MacLennan, Jean. Hair processing shield. 4,298,014, Cl. 132-9.000.

Mada, Mitsuo: *See—*
Mutai, Masahiko; Mada, Mitsuo; and Shimada, Kiyohiro, 4,298,619, Cl. 426-43.000.

Maes, Roland. Process for the determination of compounds showing among themselves specific binding affinities by the use of a solid phase. 4,298,687, Cl. 435-7.000.

Magnetic Peripherals Inc.: *See—*
Hennenfent, Douglas J.; Johnson, Robert A.; and Holmstrand, Allan L., 4,297,781, Cl. 29-467.000.

Magnussen, Peter: *See—*
Dockner, Toni; Kempe, Uwe; Krug, Herbert; Magnussen, Peter; Praetorius, Werner; and Szymanski, Hans J., 4,298,748, Cl. 548-347.000.

Magyar Aluminiumipari Troszt: *See—*
Nagy, Ferenc; Szabo, Ferenc; and Szucs, Zoltan F., 4,297,892, Cl. 73-826.000.

Mahnke, Earl A.; and Zoller, Christopher J., to Ericson Manufacturing Company, The. Power line fault detector circuit. 4,298,864, Cl. 340-657.000.

Maier, Alfred E.; Shimp, Alan B.; and Uram, David J., to Westinghouse Electric Corp. Circuit breaker with interchangeable rating adjuster and interlock means. 4,298,852, Cl. 335-6.000.

Maier, Horst R.: *See—*
Krauth, Axel; Maier, Horst R.; Philmann, Hans-Juergen; Foerster, Siegfried; and Kleeman, Manfred, 4,298,059, Cl. 165-166.000.

Majewicz, Thomas G.; and Ropp, Walter S., to Hercules Incorporated. Method of preparing hydroxyethyl ethers of cellulose. 4,298,728, Cl. 536-96.000.

Maki, Terrance C.: *See—*
Anderson, Ronald B.; Caneer, Clifford, Jr.; and Maki, Terrance C., 4,297,771, Cl. 24-263.0DA.

Makino, Takehisa: *See—*
Narita, Kiichi; Mori, Takasuke; Ayata, Kenzo; and Makino, Takehisa, 4,298,376, Cl. 75-49.000.

Makosch, Geunter; and Solf, Bernhard, to International Business Machines Corporation. Interferometric measuring method. 4,298,283, Cl. 356-351.000.

Makrides, Alkis C., to EIC Corporation. Removing carbon oxysulfide from gas streams. 4,298,584, Cl. 423-242.000.

Malafosse, Jean; Girou, Andre; Olivier, Herve; and Dupont, Michel, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Process of making sodium perborate. 4,298,585, Cl. 423-279.000.

Mallinckrodt, Inc.: *See—*
Lin, Wayne H. T.; Grib, James J.; and Mosier, Larry D., 4,298,592, Cl. 424-1.000.

Malone, Patrick C.: *See—*
Dick, Calvin; and Malone, Patrick C., 4,297,752, Cl. 5-52.000.

Mancini, Derek V.; and Wright, William J., to Consumers Glass Company Limited. Automatic container feed for container handling device. 4,298,137, Cl. 221-11.000.

Mangurten, Henry H.; and Vanek, Chester F. Blood sample collector. 4,298,011, Cl. 128-763.000.

Mansson, Ragnar: *See—*
Kinnander, Bo; Landa, Torstein; and Mansson, Ragnar, 4,298,433, Cl. 376-286.000.

Marchese, Vincent P.: *See—*
Corrado, Anthony P.; and Marchese, Vincent P., 4,298,181, Cl. 251-129.000.

Marciniec, Edmund T., to Extel Corp. Thin film thermal print head. 4,298,786, Cl. 219-216.000.

Marechal, Robert, to Societe Anonyme SICMA - Societe Industrielle; and Commerciale de Materiel Aeronautique. Control devices for use with a sheathed wire or cable. 4,297,912, Cl. 74-501.00R.

Marlo Company, Inc., The: *See*—
Hopper, Chester S.; and Case, Edward M., 4,298,207, Cl. 277-230.000.
Marlow, John V.: *See*—
Sakauye, Randall T.; Marlow, John V.; Laurie, Gordon H.; and Seymour, Theodore J., 4,297,866, Cl. 72-186.000.
Marmon Company: *See*—
Schrecongost, Ray B., 4,297,935, Cl. 84-1.010.
Marshall and Williams Company: *See*—
Wyman, Floyd H., 4,298,473, Cl. 210-213.000.
Marston Excelsior Limited: *See*—
Warne, Michael A., 4,298,445, Cl. 204-196.000.
Maruscak, John: *See*—
Jackson, Ronald A.; and Maruscak, John, 4,298,095, Cl. 182-184.000.
Marushima, Giichi; Tanaka, Hiroshi; Tosaka, Umi; Takahashi, Shinkichi; and Komiyu, Takao, to Canon Kabushiki Kaisha. Electrophotographic process and apparatus. 4,298,669, Cl. 430-55.000.
Marx, Thomas O., to Atwood Vacuum Machine Company. Gas spring with improved terminal connector and mounting means. 4,298,194, Cl. 267-64.110.
Masaki, Masaru; Ito, Yoshinori; Inoue, Akihiko; and Toda, Munetaka, to Toyota Jidosha Kogyo Kabushiki Kaisha. Pipe end expanding or contracting process utilizing ironing. 4,297,867, Cl. 72-347.000.
Mashima, Kazuto: *See*—
Nagata, Toshiyuki; Terashima, Masahiko; and Mashima, Kazuto, 4,298,628, Cl. 426-656.000.
Massachusetts Institute of Technology: *See*—
Fernstrom, John D.; and Sved, Alan F., 4,298,611, Cl. 424-261.000.
Harney, Robert C., 4,298,280, Cl. 356-5.000.
Monroe, Scott C., 4,298,953, Cl. 364-825.000.
Mastrot, Albert: *See*—
Kucza, Jean-Claude; Mastrot, Albert; Perrot, Rene; and Wattier, Jean-Mary, 4,297,777, Cl. 29-420.000.
Masugi, Takashi: *See*—
Ueda, Ikuo; Takaya, Takao; Kobayashi, Masakazu; Masugi, Takashi; Takasugi, Hisashi; Kochi, Hiromu; and Kitaguchi, Tadashi, 4,298,529, Cl. 260-340.90R.
Masuzawa, Sigeaki; Saiji, Mituhiro; and Tanimoto, Akira, to Sharp Kabushiki Kaisha. Display device for electronic calculator or the like. 4,298,865, Cl. 340-706.000.
Mather & Platt Limited: *See*—
Bray, Geddes A., 4,298,068, Cl. 169-39.000.
Matsuda, Motonobu; Matsui, Tohru; and Tanaka, Yoshihiro, to Minolta Camera Kabushiki Kaisha. Distance measuring device. 4,298,258, Cl. 354-25.000.
Matsui, Katsuhiko, to Nissan Motor Company, Limited. Idling rotational speed control system for a diesel engine. 4,297,978, Cl. 123-339.000.
Matsui, Tohru: *See*—
Matsuda, Motonobu; Matsui, Tohru; and Tanaka, Yoshihiro, 4,298,258, Cl. 354-25.000.
Matsunaga, Isao: *See*—
Oi, Nobuhiro; Aoki, Bunya; Shinozaki, Teizo; Moro, Kanji; Matsunaga, Isao; Noto, Takao; Nebashi, Toshiyuki; Harada, Yusuke; Endo, Hisao; Kimura, Takao; Okazaki, Hiroshi; Ogawa, Haruki; and Shindo, Minoru, 4,298,605, Cl. 424-246.000.
Matsuo, Takehiko: *See*—
Murai, Keiichi; and Matsuo, Takehiko, 4,298,670, Cl. 430-67.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Baba, Takaaki; Sagishima, Takayuki; Kitani, Teruo; and Sasaki, Reiichi, 4,298,891, Cl. 358-183.000.
Matsuura, Shizuya; and Konishi, Fumiya, 4,298,803, Cl. 250-492.200.
Matsushita Electric Works, Ltd.: *See*—
Mihara, Haruhiko, 4,298,779, Cl. 200-335.000.
Matsushita Electronics Corporation: *See*—
Fukuda, Makoto, 4,298,822, Cl. 313-493.000.
Matsushita, Yoshihiro: *See*—
Ochiai, Michihiko; Okada, Taiiti; Aki, Osami; Morimoto, Akira; Kawakita, Kenji; and Matsushita, Yoshihiro, 4,298,606, Cl. 424-246.000.
Matsuura, Shizuya; and Konishi, Fumiya, to Matsushita Electric Industrial Co., Ltd. Process and apparatus for making fine-scale patterns. 4,298,803, Cl. 250-492.200.
Mattchen, Terry M., to American Safety Equipment Corporation. Surgical device using impulse motor. 4,298,074, Cl. 173-129.000.
Mattucci, Neil: *See*—
Land, Edwin H.; Cerankowski, Leon D.; and Mattucci, Neil, 4,298,674, Cl. 430-213.000.
Max-Planck-Gesellschaft zur Forderung Wissenschaften e.V.: *See*—
Claussen, Nils; and Steeb, Jorg, 4,298,385, Cl. 501-105.000.
Maxey, Carl W.; and Leyde, Warren, to Carl Maxey Company, The. Measuring apparatus. 4,298,286, Cl. 356-381.000.
May, George H., to Emerson Electric Co. Field replaceable electrode assembly for magnetic flowmeter. 4,297,896, Cl. 73-861.120.
Maydan, Dan, to Bell Telephone Laboratories, Incorporated. High capacity etching apparatus and method. 4,298,443, Cl. 204-192.00E.
Mayer, Andreas: *See*—
Fried, Reinhard; Mayer, Andreas; and Perego, Ambrogio, 4,298,028, Cl. 137-868.000.
Mayerjak, Robert J., to Currier Piano Company, Inc. Arm and key bed assembly for a piano and the like. 4,297,937, Cl. 84-430.000.
Mayr, Adolfo; Galli, Paolo; Susa, Ermanno; Di Drusco, Giovanni; and Giachetti, Ettore, to Montecatini Edison S.p.A. Catalysts for the polymerization of olefins. 4,298,718, Cl. 526-125.000.
McCain, G. Howard: *See*—
Baczek, Stanley K.; and McCain, G. Howard, 4,298,697, Cl. 521-27.000.
McCandless, Harry E., to RCA Corporation. Electron gun. 4,298,818, Cl. 313-417.000.
McCarter Corporation, The: *See*—
McCarter, Louis N., III; Deemer, W. Robert; Meeker, Robert G.; Weaver, Harry B.; and Smith, John W., 4,298,287, Cl. 366-4.000.
McCarter, Louis N., III; Deemer, W. Robert; Meeker, Robert G.; Weaver, Harry B.; and Smith, John W., to McCarter Corporation, The. Center draft asphaltic concrete drum mixer. 4,298,287, Cl. 366-4.000.
McCartney, Larry P.: *See*—
Saus, J. Arthur; and McCartney, Larry P., 4,298,405, Cl. 148-6.15R.
McCarty, John C.; and Wagner, Terrence E., to B. F. Goodrich Company, The. Powdered elastomers and process therefor. 4,298,654, Cl. 428-407.000.
McCarty, William J.; and Ruark, Bruce L., to General Electric Company. Air valve heat pump. 4,297,854, Cl. 62-325.000.
McCarty, William J.; and Ruark, Bruce L., to General Electric Company. Air valve heat pump. 4,297,855, Cl. 62-325.000.
McCulloch, Colin F.: *See*—
Atkinson, Donald A.; and McCulloch, Colin F., 4,298,191, Cl. 266-165.000.
McCurdy, Frederic, to Graphic Technology, Inc. Slide programming device. 4,298,124, Cl. 206-455.000.
McDonnell Douglas Corporation: *See*—
Kendall, John H., 4,298,176, Cl. 244-135.00A.
McDougal, Thomas F. Quick set hydraulically actuated clamping table. 4,298,195, Cl. 269-32.000.
McElligott, Michael J.; and Tkalenko, Victor J., Jr., to Burroughs Corporation. Protection system for documents. 4,298,216, Cl. 203-6.000.
McGill, Robert N., to Du Pont de Nemours, E. I., and Company. Isomerization of 2-methyl-3-butenenitrile. 4,298,546, Cl. 260-465.900.
McGinnis, Gerald E. Spring loaded exhalation valve. 4,298,023, Cl. 137-529.000.
McGovern, Terrence P.; and Schreck, Carl E., to United States of America, Agriculture. Insect repellents. 4,298,612, Cl. 424-267.000.
McGugan, John D., to Hunting Oilfield Services (U.K.) Limited. Pipe connectors. 4,298,221, Cl. 285-328.000.
McKee, William H., to TRW Inc. Electrical socket contact. 4,298,242, Cl. 339-258.00R.
McKeever, Mark R., to Du Pont de Nemours, E. I., and Company. Photosensitive compositions and elements containing substituted hydroxylamine. 4,298,678, Cl. 430-281.000.
McKinley, Milton A., to Surgeonics Limited. Controls for heating system. 4,298,165, Cl. 237-8.00R.
McLeod, Jesse C. Valve timer devices. 4,298,024, Cl. 137-624.110.
McNeilab, Inc.: *See*—
Rasmussen, Chris R., 4,298,746, Cl. 548-315.000.
McPhail, Shelvey C. Storm door assembly. 4,297,812, Cl. 49-386.000.
McQuay, William C.: *See*—
Altman, Wilbur E.; and McQuay, William C., 4,297,765, Cl. 17-66.000.
Mead Johnson & Company: *See*—
Temple, Davis L., Jr., 4,298,734, Cl. 544-251.000.
Mechtron International Corporation: *See*—
Butler, G. Theodore; Porter, Travis G.; and Fisher, Harold E., 4,298,337, Cl. 431-285.000.
Medlock, Alfred A. Method for modifying a fluid fuel metering jet orifice. 4,297,774, Cl. 29-157.00C.
Meeker, Robert G.: *See*—
McCarter, Louis N., III; Deemer, W. Robert; Meeker, Robert G.; Weaver, Harry B.; and Smith, John W., 4,298,287, Cl. 366-4.000.
Mehring, Jeffrey S.; Sayen, Ronald J.; Schara, Robert E.; Stocker, Charles T.; and Rodriguez, Juan G., to General Foods Corp. Protection against mite contamination. 4,298,624, Cl. 426-532.000.
Meier, Willi, to Dorina Nahmaschinen GmbH. Zigzag sewing machine having base-mounted operating elements for controlling sewing. 4,297,956, Cl. 112-158.00A.
Meiji Seika Kaisha, Ltd.: *See*—
Amano, Shoichi; Miyadoh, Shinji; Takahashi, Saeko; Ezaki, Norio; Niwa, Tomizo; and Yamada, Yujiro, 4,298,599, Cl. 424-119.000.
Meitner, Gary H., to Kimberly-Clark Corporation. Nonwoven disposable wiper. 4,298,649, Cl. 428-198.000.
Melis, Johannes H. A. M.; and Le Mair, Willem, to U.S. Philips Corporation. Portable element for receiving, storing, displaying and outputting digital data, and a reservation device for use in a reservation system. 4,298,793, Cl. 235-487.000.
Melling, John R., to Plessey Handel und Investments AG. Transistorized invertor. 4,298,925, Cl. 363-131.000.
Melton, Keith; Mercier, Olivier; and Taiana, Peter, to BBC Brown, Boveri & Company, Limited. Method of joining structural elements. 4,297,779, Cl. 29-446.000.
Meltz, Gerald: *See*—
Snitzer, Elias; and Meltz, Gerald, 4,298,794, Cl. 250-227.000.
Menashi, Jameel; Rappas, Alkis S.; and Douglas, Donald A., to Cabot Corporation. Vanadium recovery from scrap alloys. 4,298,582, Cl. 423-58.000.
Menashi, Jameel: *See*—
Douglas, Donald A.; Menashi, Jameel; and Rappas, Alkis S., 4,298,581, Cl. 423-58.000.
Mende, Ernst W. Hose water leveling instrument. 4,297,791, Cl. 33-367.000.

Mendelsohn, Morris A., to Westinghouse Electric Corp. Epoxy-elastomer low temperature curable, solventless, sprayable, stator winding adhesive-bracing compositions. 4,298,656, Cl. 428-414.000.
Mendola, Charles F., to Simala, John J., a part interest. Mining machine. 4,298,232, Cl. 299-64.000.
Mercier, Jacques H., to Normand Trust. Adjustable pulse dampener. 4,298,030, Cl. 138-30.000.
Mercier, Olivier: *See—*
Melton, Keith; Mercier, Olivier; and Taiana, Peter, 4,297,779, Cl. 29-446.000.
Merck & Co., Inc.: *See—*
Cheng, Hsiung; and Wintersdorff, Peter, 4,298,729, Cl. 536-102.000.
Christensen, Burton G.; Guthikonda, Ravindra N.; and Ratcliffe, Ronald W., 4,298,741, Cl. 546-272.000.
Cragoe, Edward J., Jr.; Rooney, Clarence S.; and Williams, Haydn W. R., 4,298,743, Cl. 548-203.000.
Veeder, George T.; and Kang, Kenneth S., 4,298,691, Cl. 435-101.000.
Meredith, Michael D.: *See—*
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Torregrossa, Louis O.; Bentvelzen, Jozef M.; Crosby, Gerald D.; Meredith, Michael D.; and Bepple, Henry, 4,298,426, Cl. 162-57.000.
Merten, Rudolf: *See—*
Lewalter, Jurgen; Rottmaier, Ludwig; Merten, Rudolf; Zecher, Wilfried; Dunwald, Willi; and Schulte, Bernhard, 4,298,515, Cl. 260-30.40N.
Metal Innovations, Inc.: *See—*
Ayers, Maurice D., 4,298,553, Cl. 264-11.000.
Metallurgie Hoboken-Overpelt: *See—*
Dompas, John; and Petry, Charles J., 4,298,053, Cl. 164-429.000.
Metcalf, Paul T., II, to Keene Corporation. Fluorescent fixture socket. 4,298,918, Cl. 362-217.000.
Meyborg, Holger; and Weber, Christian, to Bayer Aktiengesellschaft. Process for the production of elastic shaped articles. 4,298,701, Cl. 521-51.000.
Meyer, Richard C.: *See—*
Lillig, John E.; and Meyer, Richard C., 4,298,570, Cl. 422-64.000.
Meyers, Stuart R. Therapeutic shoe. 4,297,797, Cl. 36-44.000.
Mezrich, Reuben S.; Vilkomerson, David H. R.; and Gardineer, Bayard, to Technicare Corporation. Ultrasound mammary scanning apparatus. 4,298,009, Cl. 128-660.000.
Micca, Mario: *See—*
Norlander, Gosta; Vignotto, Angelo; and Micca, Mario, 4,298,079, Cl. 175-339.000.
Michelet, Guy; and Treton, Jean-Pierre, to Quantel S.A. Thick optical element having a variable curvature. 4,298,247, Cl. 350-295.000.
Micro-Circuits Company: *See—*
Bradley, Robert F.; and Bradley, Lindell P., 4,298,115, Cl. 194-4.00F.
Microwave Antenna Systems and Technology Inc.: *See—*
Pellerin, Andrew P.; and Theophile, Christ, 4,298,850, Cl. 333-257.000.
Mihai, Gabriel: *See—*
Alper, Yekutiel; Elkin, Itzhak; Wolf, Itzhak; Mihai, Gabriel; and Antler, Aharon, 4,297,832, Cl. 56-328.00R.
Mihara, Haruhiko, to Matsushita Electric Works, Ltd. Rotary type microswitch. 4,298,779, Cl. 200-335.000.
Mikami, Iwao: *See—*
Natsugari, Hideaki; Mikami, Iwao; and Ochiai, Michihiko, 4,298,607, Cl. 424-246.000.
Miki, Masayuki: *See—*
Sasayama, Takao; Nishimura, Yutaka; Sakamoto, Shinichi; and Miki, Masayuki, 4,297,881, Cl. 73-204.000.
Mikura, Chiho; and Shibata, Fujio, to TDK Electronics Co., Ltd. Method for smoothing both magnetic coat layers of magnetic recording medium. 4,298,631, Cl. 427-130.000.
Miles, Wilbur N.: *See—*
Benjamin, Milton L.; and Miles, Wilbur N., 4,298,208, Cl. 279-91.000.
Miller, Gary W.: *See—*
Barnes, Johnny G.; Hurley, Patrick J.; and Miller, Gary W., 4,298,290, Cl. 400-3.000.
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Stover, K. Lawrence; Bueno, Alejandro G.; Miller, James W.; and Shamp, Donald E., 4,298,372, Cl. 65-136.000.
Mills, Frank S., to Honeywell Inc. Conductive polymer film humidity sensor. 4,298,855, Cl. 338-35.000.
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Wright, Thomas C.; Hudrlik, Terrence R.; Mills, Perry A.; Rust, Robert C.; and Wallner, Thomas G., 4,298,007, Cl. 128-419.0PG.
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Minagawa, Kenichiro: *See—*
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Minagawa, Motonobu; Nakahara, Yutaka; and Takahashi, Masayuki, to Argus Chemical Corp. Phenolic ester synthetic resin stabilizers. 4,298,520, Cl. 260-45.80R.
Minami, Setsuo: *See—*
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Mineyuki, Seizo: *See—*
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Ministry of International Trade & Industry: *See—*
Kawase, Kaoru; and Hayakawa, Kiyoshi, 4,298,698, Cl. 521-27.000.
Minnesota Mining and Manufacturing Company: *See—*
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Minolta Camera Kabushiki Kaisha: *See—*
Matsuda, Motonobu; Matsui, Tohru; and Tanaka, Yoshihiro, 4,298,258, Cl. 354-25.000.
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Mitake, Kenjiro; and Kurakami, Osamu, to Nippon Electric Co., Ltd. Memory integrated circuit. 4,298,960, Cl. 365-210.000.
Mitakidis, Dimitrios: *See—*
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Mitsubishi Chemical Industries, Ltd.: *See—*
Ohmura, Yasuhiro; Murakami, Yukinobu; and Hidaka, Ryoji, 4,298,518, Cl. 260-32.6NA.
Uchida, Mitsuo; Oguri, Yasuo; Saito, Junji; and Kawahara, Tsukasa, 4,298,561, Cl. 264-86.000.
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Akamatsu, Masahiko; and Uchida, Ryohei, 4,298,838, Cl. 324-117.00R.
Iwamura, Seishiro, 4,298,246, Cl. 350-122.000.
Mitsubishi Gas Chemical Company, Inc.: *See—*
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Mitsubishi Petrochemical Co., Ltd.: *See—*
Konno, Kazuhiko; Goh, Atsushi; and Sugaya, Kiyoshi, 4,298,740, Cl. 546-226.000.
Mitsubishi Yuka Pharmaceutical Co., Ltd.: *See—*
Morinaka, Yasuhiro; and Takahashi, Kazuo, 4,298,610, Cl. 424-256.000.
Mitsui Petrochemical Industries, Ltd.: *See—*
Morita, Yoshinori; Toyota, Akinori; and Kashiwa, Norio, 4,298,713, Cl. 525-323.000.
Mitsui Toatsu Chemicals Incorporated: *See—*
Yamazaki, Noboru; Takase, Tsutomu; Morimoto, Yoshio; and Yuasa, Teruo, 4,298,720, Cl. 526-262.000.
Miyadoh, Shinji: *See—*
Amano, Shoichi; Miyadoh, Shinji; Takahashi, Saeko; Ezaki, Norio; Niwa, Tomizo; and Yamada, Yujiro, 4,298,599, Cl. 424-119.000.
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Miyashita, Kiyoshi: *See—*
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Mizuma, Takashi, to Toyo Kogyo Co., Ltd. Sun-roof structure for automobile bodies. 4,298,226, Cl. 296-216.000.
Mizuno, Toshiya; Ohta, Mitsuru; and Segawa, Masahiro, to Kureha Kagaku Kogyo Kabushiki Kaisha. Doubly oriented film of polyvinylidene fluoride. 4,298,719, Cl. 526-255.000.
Mizuoka, Seishi: *See—*
Honda, Akira; Anzai, Takanori; Kitamura, Minoru; Ishikawa, Masaru; and Mizuoka, Seishi, 4,298,147, Cl. 222-601.000.
Mobil Oil Corporation: *See—*
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Butter, Stephen A.; Chester, Arthur W.; and Schwartz, Albert B., 4,298,695, Cl. 518-720.000.
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Dennis, Charles L., 4,298,805, Cl. 376-111.000.
Horodysky, Andrew G.; and Kaminski, Joan M., 4,298,484, Cl. 252-46.700.

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Ruehle, William H., 4,298,966, Cl. 367-50.000.
Ruehle, William H.; and Hodge, John D., 4,298,968, Cl. 367-59.000.
Schoennagel, Hans-Juergen; and Zahner, John C., 4,298,453, Cl. 208-10.000.
Yan, Tsoung-yuan; and Lozano, Raymond L., 4,298,578, Cl. 423-7.000.
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Mochizuki, Koichi: *See—*
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Mohapatra, Sarat K.: *See—*
Boyd, Gary D.; Mohapatra, Sarat K.; Tell, Benjamin; Wagner, Sigurd; and Wudl, Fred, 4,298,250, Cl. 350-357.000.

Moisar, Erik: *See—*
Becker, Manfred; Slabik, Angela; Mucke, Bruno; Moisar, Erik; and von Rintelen, Harald, 4,298,683, Cl. 430-569.000.

Molinari, Ewald: *See—*
Seidel, Dietrich; Wieland, Heinrich; and Molinari, Ewald, 4,298,441, Cl. 204-180.00G.

Mollura, Carlos A. Non-planar waterbed. 4,297,755, Cl. 5-455.000.

Moloy, Peter J. Middle ear balloon. 4,297,748, Cl. 3-1.000.

Monarch Machine Tool Company, The: *See—*
Bradlee, Charles R., 4,298,633, Cl. 427-172.000.

Mondial Piston - Dott. Galli Ercole & C. S.p.A.: *See—*
Galli, Ercole, 4,297,975, Cl. 123-193.00P.

Monley, Robert E.: *See—*
Schneider, Urban A.; Monley, Robert E.; Nelson, Robert L.; and Glatthorn, Raymond H., 4,298,783, Cl. 219-75.000.

Monroe, Scott C., to Massachusetts Institute of Technology. Programmable zero-bias floating gate tapping method and apparatus. 4,298,953, Cl. 364-825.000.

Monsanto Company: *See—*
Dufour, Daniel L., 4,298,716, Cl. 526-65.000.
Howe, Robert K.; and Lee, Len F., 4,298,375, Cl. 71-90.000.
Van Eenam, Donald N., 4,298,639, Cl. 427-386.000.
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Montalto, Anthony R.; Scerbo, Louis J.; and Starace, Jeremia P., to Bell Telephone Laboratories, Incorporated. Test access apparatus. 4,298,239, Cl. 339-66.00M.

Montecatini Edison S.p.A.: *See—*
Mayr, Adolfo; Galli, Paolo; Susa, Ermanno; Di Drusco, Giovanni; and Giachetti, Ettore, 4,298,718, Cl. 526-125.000.

Montedison S.p.A.: *See—*
Borghi, Italo; Foschi, Sergio; and Galli, Paolo, 4,298,721, Cl. 526-348.000.

Montgomery, Gary V., to Sunbeam Plastics Corporation. One-piece dispensing closure. 4,298,146, Cl. 222-536.000.

Moore, Richard W.: *See—*
Wootton, Gordon; and Moore, Richard W., 4,298,745, Cl. 548-313.000.

Moran, Harold J., to Switlik Parachute Company, Inc. Life preserver of the encapsulated type. 4,297,758, Cl. 9-340.000.

Moraw, Roland; and Walter, Helmut, to Hoechst Aktiengesellschaft. Identity card. 4,298,217, Cl. 283-7.000.

Morhart, Rudolf: *See—*
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Mori, Takasuke: *See—*
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Morimoto, Akira: *See—*
Ochiai, Michihiko; Okada, Taiiti; Aki, Osami; Morimoto, Akira; Kawakita, Kenji; and Matsushita, Yoshihiro, 4,298,606, Cl. 424-246.000.

Morimoto, Yoshio: *See—*
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Morinaka, Yasuhiro; and Takahashi, Kazuo, to Mitsubishi Yuka Pharmaceutical Co., Ltd. Ester derivatives of quinolopyran-4-one-2-carboxylic acids and antiallergic antasthmatics. 4,298,610, Cl. 424-256.000.

Morita, Koyo: *See—*
Nishizuka, Hiroshi; Komoriya, Susumu; Morita, Koyo; and Osakaya, Takayoshi, 4,298,273, Cl. 355-61.000.

Morita, Yoshinori; Toyota, Akinori; and Kashiwa, Norio, to Mitsui Petrochemical Industries, Ltd. Process for preparing low density ethylene copolymers. 4,298,713, Cl. 525-323.000.

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Moro, Christian D.; and Ranini, Daniel G., to Poclain. Power arm fitted with coupling devices for a member provided to control its position. 4,297,815, Cl. 52-115.000.

Moro, Kanji: *See—*
Oi, Nobuhiro; Aoki, Bunya; Shinozaki, Teizo; Moro, Kanji; Matsunaga, Isao; Noto, Takao; Nebashi, Toshiyuki; Harada, Yusuke; Endo, Hisao; Kimura, Takao; Okazaki, Hiroshi; Ogawa, Haruki; and Shindo, Minoru, 4,298,605, Cl. 424-246.000.

Morokawa, Shigeru; and Koga, Keiichiro, to Citizen Watch Company Limited. Electronic timpiece. 4,298,971, Cl. 368-204.000.

Moroto, Shuzo; and Kobayashi, Koji, to Aisin-Warner K.K. Automatic four-wheel drive transfer case. 4,298,085, Cl. 180-247.000.

Morris Photo Ind. Co. Ltd.: *See—*
Nakayama, Yasuo, 4,298,826, Cl. 315-151.000.

Morrow, Alan J.: *See—*
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Morton, Donald F., to British Aerospace Public Limited Company. Gimbals. 4,297,904, Cl. 74-5.00F.

Moses, Peter R., to Duracell International Inc. Predischarged nonaqueous cell. 4,298,663, Cl. 429-50.000.

Mosier, Larry D.: *See—*
Lin, Wayne H. T.; Grib, James J.; and Mosier, Larry D., 4,298,592, Cl. 424-1.000.

Moss Rosenberg Verft A.S.: *See—*
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Motorola, Inc.: *See—*
Arneson, Steven H., 4,298,849, Cl. 333-193.000.
Kennedy, Peter D.; and Piesinger, Gregory H., 4,298,871, Cl. 343-100.0SA.
Perkins, Geoffrey W., 4,298,886, Cl. 358-74.000.

Moulson, Thomas J.; and Greenzweig, John E., to Cargill Incorporated. Low shrink unsaturated polyester resinous composition. 4,298,711, Cl. 525-40.000.

Mourray, Jack W., to Ford Motor Company. Upper mounting unit for MacPherson strut assembly. 4,298,193, Cl. 267-63.00R.

Mouton, Martin J. Retractable fret system for stringed instruments. 4,297,936, Cl. 84-314.00R.

Mucke, Bruno: *See—*
Becker, Manfred; Slabik, Angela; Mucke, Bruno; Moisar, Erik; and von Rintelen, Harald, 4,298,683, Cl. 430-569.000.

Muehllehner, Gerd: *See—*
Stoub, Everett W.; Colsher, James G.; and Muehllehner, Gerd, 4,298,944, Cl. 364-515.000.

Mueller, Margarete: *See—*
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Mueller, Martin, to Owens-Illinois, Inc. Container fabricating machine. 4,298,331, Cl. 425-393.000.

Muller, Helmuth; and Herrmann, Lother, to Kienzle Apparate GmbH. Scanning device for preselector counter mechanism. 4,298,791, Cl. 235-132.00R.

Muller, Klaus; and Zimmermann, Andreas, to BBC Brown, Boveri & Company, Limited. Electrophoretic display. 4,298,448, Cl. 204-299.00R.

Mumford, Eustace H.; and Perry, Jack L., to Owens-Illinois, Inc. Apparatus for cushioning the motion of reciprocating members. 4,298,373, Cl. 65-260.000.

Munday, George; Slater, David H.; Tyley, Leonard R. T.; Berenblut, Brian J.; and Whitehouse, Harry B., to Insurance Technical Bureau, The. Method of and apparatus for the detection and analysis of hazards. 4,298,955, Cl. 364-900.000.

Munker, Helmut: *See—*
Knoth, Werner D.; and Munker, Helmut, 4,298,371, Cl. 65-79.000.

Murai, Keiichi; and Matsuo, Takehiko, to Canon Kabushiki Kaisha. Photosensitive element for electrophotography. 4,298,670, Cl. 430-67.000.

Murakami, Keikichi, to Kawasaki Jukogyo Kabushiki Kaisha. Rotary steel converter, method of making steel there-with and method of applying refractory lining to converter. 4,298,378, Cl. 75-60.000.

Murakami, Yukinobu: *See—*
Ohmura, Yasuhiro; Murakami, Yukinobu; and Hidaka, Ryoji, 4,298,518, Cl. 260-32.6NA.

Murata Manufacturing Co., Ltd.: *See—*
Kaneko, Fumihiko; Nitta, Koichi; and Saito, Kouichi, 4,298,120, Cl. 206-329.000.

Murayama, Seiichi: *See—*
Yamamoto, Manabu; Murayama, Seiichi; Ito, Masaru; and Oishi, Kounosuke, 4,298,284, Cl. 356-368.000.

Murayama, Yuko: *See—*
Saito, Masao; Hosokawa, Motoyuki; Kawakami, Takamasa; and Murayama, Yuko, 4,298,545, Cl. 260-465.00H.

Muroi, Masayuki: *See—*
Higashide, Eiji; Tanida, Seiichi; Muroi, Masayuki; and Asai, Mitsuko, 4,298,600, Cl. 424-120.000.

Murphy, Susan F.: *See—*
Blaszyk, Paul E.; and Murphy, Susan F., 4,298,364, Cl. 65-3.110.

Murray, Michael L. Multiple compartment containers. 4,298,119, Cl. 206-219.000.

Mutai, Masahiko; Mada, Mitsuo; and Shimada, Kiyohiro, to Kabushiki Kaisha Yakult Honsha. Production of foods and drinks containing bifidobacteria. 4,298,619, Cl. 426-43.000.

Mutzhas, Maxim F. Radiation apparatus. 4,298,005, Cl. 128-396.000.

Myers, Richard A., to Ford Motor Company. Transmission gear selector control. 4,297,910, Cl. 74-473.00R.

Nagai, Shunichi; and Higashi, Hidekazu, to Kabushiki Kaisha Komatsu Seisakusho. Control circuit for a press. 4,298,114, Cl. 192-129.00A.

Nagaishi, Hatsuo; and Kita, Toru, to Nissan Motor Co., Ltd. Mass flow sensor. 4,297,894, Cl. 73-861.030.

Nagashima, Mitsuo: *See—*
Saito, Shoji; and Nagashima, Mitsuo, 4,298,131, Cl. 220-231.000.

Nagata, Toshiyuki; Terashima, Masahiko; and Mashima, Kazuto, to Fuji Oil Company, Ltd. Method for manufacturing fried tofu products. 4,298,628, Cl. 426-656.000.

Nagy, Ferenc; Szabo, Ferenc; and Szucs, Zoltan F., to Magyar Aluminiumipari Troszt. Process and apparatus for the measurement of the anisotropy value of form changes in normal direction in sheet metals. 4,297,892, Cl. 73-826.000.

Nahemow, Martin D.: *See—*
Justice, James W. H.; and Nahemow, Martin D., 4,298,828, Cl. 315-248.000.

Naito, Hideshi: *See—*
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Nakada, Kiyoshi: *See—*
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Nakagawa, Kazuyuki: *See—*
Nishi, Takao; Ueda, Hiraki; and Nakagawa, Kazuyuki, 4,298,739, Cl. 546-158.000.

Nakagawa, Takeo, to Keinosuke Aida. Steel fiber for reinforced concrete. 4,298,660, Cl. 428-599.000.

Nakahara, Yutaka: *See—*
Minagawa, Motonobu; Nakahara, Yutaka; and Takahashi, Masayuki, 4,298,520, Cl. 260-45.80R.

Nakahira, Nobuichi: *See—*
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Nakaie, Yutaka: *See—*
Tamura, Hiroshi; and Nakaie, Yutaka, 4,298,947, Cl. 364-557.000.

Nakajima, Koichiro; and Watanabe, Masaharu, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for growing a liquid phase epitaxial layer on a semiconductor substrate. 4,298,410, Cl. 148-172.000.

Nakajima, Yahei, to Ushio Denki Kabushikikaisha. Power source circuit for a flash discharge lamp. 4,298,827, Cl. 315-241.00R.

Nakamura, Haruka, to Ricoh Company, Ltd. Data communication apparatus. 4,298,978, Cl. 370-92.000.

Nakamura, Kyoichi: *See—*
Ueno, Takashi; and Nakamura, Kyoichi, 4,298,706, Cl. 521-92.000.

Nakamura, Noboru: *See—*
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Nakamura, Takashi: *See—*
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Nakao, Sho: *See—*
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Nakashima, Yoichi: *See—*
Sakurada, Shuroku; Nakashima, Yoichi; Kojima, Isao; Yagi, Hideyuki; Kariya, Tadaaki; and Sugiyama, Masayoshi, 4,298,881, Cl. 357-38.000.

Nakayama, Yasuo, to Morris Photo Ind. Co. Ltd. Automatic flash unit. 4,298,826, Cl. 315-151.000.

Nakazawa, Kenichi: *See—*
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Nalco Chemical Company: *See—*
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Cole, Jack L., 4,298,477, Cl. 210-674.000.
Colombo, Paul T., 4,298,497, Cl. 252-387.000.

Nara, Takashi: *See—*
Iida, Takao; Shirahata, Kunikatsu; Ishii, Shinzo; Okachi, Ryo; and Nara, Takashi, 4,298,690, Cl. 435-80.000.

Narita, Kiichi; Mori, Takasuke; Ayata, Kenzo; and Makino, Takehisa, to Kobe Steel, Ltd. Method for treating molten steel and apparatus therefor. 4,298,376, Cl. 75-49.000.

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Nasyrov, Nail Z.: *See—*
Bochkarev, Ellin P.; Prokopov, Igor V.; Eljutin, Alexandr V.; Belsky, Arkady A.; Baryshnikova, Svetlana M.; Nasyrov, Nail Z.; Novikov, Nikolai A.; Khairulin, Edige R.; Zvyagin, Mikhail S.; Abrjutin, Vladimir N.; Konstantinova, Ljubov I.; Ljubimova, Nina A.; and Gorbacheva, Nadezhda S., 4,298,380, Cl. 75-101.0BE.

Nathasingh, Davidson M.: *See—*
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National Patent Development Corporation: *See—*
Ronel, Samuel H.; D'Andrea, Mark J.; Dobelle, William H.; Klomp, Gregory F.; and Hashiguchi, Hiroshi, 4,298,002, Cl. 128-260.000.

National Research Development Corporation: *See—*
Perry, Forbes G. deB., 4,297,918, Cl. 74-690.000.

National Solar Corporation: *See—*
Easton, Anthony, 4,297,991, Cl. 126-448.000.

National-Standard Company: *See—*
Joyce, John F., 4,298,383, Cl. 75-211.000.

Natitus, Donald P.; and Carlson, Curt T., to St. Anthony Hospital Systems. Portable patient call. 4,298,863, Cl. 340-573.000.

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Naus, Hubert W.; and Bouvier, Alfred J., to International Telephone and Telegraph Corporation. Method of molding electrical connector insulator. 4,298,566, Cl. 264-317.000.

Nava, Pier L. Device to actuate helmet visors, particularly for motorcyclists. 4,297,747, Cl. 2-424.000.

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Gottschalk, Robert E.; and Navarro, Felipe, 4,298,149, Cl. 224-201.000.

Navire Cargo Gear International AB: *See—*
Oleborg, Said, 4,297,964, Cl. 114-263.000.

Naydan, Bob N.: *See—*
Acker, Robert H.; Wessling, William C.; Brand, Arnold J.; and Naydan, Bob N., 4,298,832, Cl. 318-318.000.

Naylor, Carter G.: *See—*
Schulze, Heinz; Zimmerman, Robert L.; and Naylor, Carter G., 4,298,708, Cl. 521-115.000.

Nebashi, Toshiyuki: *See—*
Oi, Nobuhiro; Aoki, Bunya; Shinozaki, Teizo; Moro, Kanji; Matsunaga, Isao; Noto, Takao; Nebashi, Toshiyuki; Harada, Yusuke; Endo, Hisao; Kimura, Takao; Okazaki, Hiroshi; Ogawa, Haruki; and Shindo, Minoru, 4,298,605, Cl. 424-246.000.

Neef, Gunter; Eder, Ulrich; Haffer, Gregor; and Sauer, Gerhard, to Schering, Aktiengesellschaft. 16-Dimethylaminomethylene-3-methoxy-1,3,5-(10)-estratrien-17-one, a process for the preparation thereof and its use as a preparative intermediate. 4,298,538, Cl. 260-397.400.

Neff, James A., to Mac Valves, Inc. Three-way normally closed pilot valve. 4,298,027, Cl. 137-625.650.

Nei, Hiromichi; Ohtani, Ryoichi; Ohshima, Iwao; and Horikawa, Yuji, to Tokyo Shibaura Denki Kabushiki Kaisha. Plugging device. 4,297,873, Cl. 73-61.0LM.

Nelson, Daniel E.: *See—*
Klem, John E.; and Nelson, Daniel E., 4,297,914, Cl. 74-532.000.

Nelson, Lorne W., to Honeywell Inc. Heat pump setback temperature control with cold weather override. 4,298,056, Cl. 165-12.000.

Nelson, Robert L.: *See—*
Schneider, Urban A.; Monley, Robert E.; Nelson, Robert L.; and Glatthorn, Raymond H., 4,298,783, Cl. 219-75.000.

Neth, Walter, to Columbia Machine, Inc. Method and apparatus for transferring loads. 4,298,305, Cl. 414-498.000.

Neuworth, Martin B., to United States of America, Energy. Two stage liquefaction of coal. 4,298,451, Cl. 208-8.0LE.

Nevstruev, Vladimir I.: *See—*
Batalin, Oleg E.; Dykman, Arkady S.; Osadchenko, Alexandr I.; Balkhanova, Galina F.; Belgorodsky, Izrail M.; Nevstruev, Vladimir I.; Radionov, Valery A.; Tulchinsky, Eduard A.; Belyaev, Valentin M.; Smolin, Jury I.; Breiman, Mark I.; Orlyansky, Vitaly V.; Zhirnov, Nikolai Y.; Galibin, Nikolai V.; Troitsky, Adrian P.; and Kovalenko, Vladimir V., 4,298,503, Cl. 252-432.000.

Newell, Marvin H. Guidance system for tracklaying tractors. 4,298,084, Cl. 180-131.000.

NGK Insulators, Ltd.: *See—*
Higuchi, Noboru; and Futamura, Shoji, 4,298,564, Cl. 264-177.00R.
Ito, Isao, 4,298,285, Cl. 356-376.000.

Nicolas, Jean C.; Terouanne, Beatrice; Descomps, Bernard; and De Paulet, Andre C., to Institut National de la Sante et de la Recherche Medicale (INSERM). Method of immunoenzymatic assay utilizing $\Delta_5$,3-keto-steroid isomerase. 4,298,686, Cl. 435-7.000.

Niemeyer, John F., to Coin Acceptors, Inc. String detector for a coin-selecting device. 4,298,116, Cl. 194-97.00R.

Nihira, Shohachi, to Citizen Watch Co., Ltd. Print hammer driving means for impact printers. 4,297,944, Cl. 101-93.310.

Nilsen, Arthur A.: *See—*
Benson, Clark K.; Caridis, Andrew A.; and Nilsen, Arthur A., 4,297,942, Cl. 99-386.000.

Nippon Electric Co., Ltd.: *See—*
Hamano, Kuniyuki; and Ohta, Toshiyuki, 4,298,962, Cl. 365-182.000.
Mitake, Kenjiro; and Kurakami, Osamu, 4,298,960, Cl. 365-210.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Imamura, Akio; and Oya, Akiyoshi, 4,297,934, Cl. 84-1.030.
Nishimoto, Tetsuo, 4,297,933, Cl. 84-1.010.

Nippon Kogaku K.K.: *See—*
Hasegawa, Hiroshi, 4,298,263, Cl. 354-234.000.
Nozawa, Hideyo; and Naito, Hideshi, 4,298,262, Cl. 354-139.000.
Saegusa, Takashi, 4,298,870, Cl. 340-785.000.
Tanaka, Etsuo; and Kato, Hironobu, 4,298,265, Cl. 354-246.000.

Nippon Kokan Kabushiki Kaisha: *See—*
Honda, Akira; Anzai, Takanori; Kitamura, Minoru; Ishikawa, Masaru; and Mizuoka, Seishi, 4,298,147, Cl. 222-601.000.

Nippon Mining Company, Limited: *See—*
Fujimori, Kuniaki; Suzuka, Teruo; Inoue, Yukio; and Aizawa, Shirou, 4,298,460, Cl. 208-121.000.

Nippon Oil and Fats Co., Ltd.: *See—*
Tanizaki, Yoshiharu; Minagawa, Kenichiro; and Takano, Yoshinori, 4,298,488, Cl. 252-78.100.

Nippon Steel Corporation: *See—*
Ikeno, Teruo; Kado, Satoshi; Ayusawa, Saburo; Kawasaki, Hironobu; and Watanabe, Takashi, 4,298,661, Cl. 428-623.000.
Ohashi, Tetsro; Kitamura, Osamu; Fujii, Hiromu; Mineyuki, Seizo; and Takeuchi, Eiichi, 4,298,050, Cl. 164-468.000.

Nippon Zeon Co. Ltd.: *See*—
Tamura, Mitsuhiro; Ohishi, Tetsuo; and Sakurai, Hiroshi, 4,298,522, Cl. 260-45.9QB.
Nishi, Takao; Ueda, Hiraki; and Nakagawa, Kazuyuki, to Otsuka Pharmaceutical Co., Ltd. Novel carbostyril derivatives. 4,298,739, Cl. 546-158.000.
Nishihara, Mikio; Oda, Masahiro; and Tsuchimoto, Takamitsu, to Fujitsu Limited. Printed board. 4,298,770, Cl. 174-68.500.
Nishikawa, Masaji: *See*—
Tsuda, Hiroshi; Miyashita, Kiyoshi; Nishikawa, Masaji; Shimizu, Akira; and Kasuga, Muneo, 4,298,270, Cl. 355-3.0SH.
Nishikawa, Masao; and Yamamoto, Hitoshi, to Honda Giken Kogyo Kabushiki Kaisha. Shock absorber for vehicle use. 4,298,102, Cl. 188-319.000.
Nishikawa, Osamu; Ishimaru, Kenji; Takeshita, Toru; and Tsuruta, Hideki, to Teijin Limited. Process for producing steroid compounds having an oxo group in the side chain. 4,298,537, Cl. 260-397.200.
Nishimatsu, Shigeru: *See*—
Suzuki, Keizo; Okudaira, Sadayuki; Nishimatsu, Shigeru; and Kanomata, Ichiro, 4,298,419, Cl. 156-345.000.
Nishimoto, Tetsuo, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument for tone formation by selectable tone synthesis computations. 4,297,933, Cl. 84-1.010.
Nishimura, Yutaka: *See*—
Sasayama, Takao; Nishimura, Yutaka; Sakamoto, Shinichi; and Miki, Masayuki, 4,297,881, Cl. 73-204.000.
Nishizuka, Hiroshi; Komoriya, Susumu; Morita, Koyo; and Osakaya, Takayoshi, to Hitachi, Ltd. Projection aligner and method of positioning a wafer. 4,298,273, Cl. 355-61.000.
Nissan Motor Company, Limited: *See*—
Fujishiro, Takeshi, 4,298,573, Cl. 422-94.000.
Kogo, Hiroshi; Tonooka, Mamoru; Aoki, Teruhisa; Ando, Shigeo; and Tomiyama, Raiji, 4,298,965, Cl. 367-13.000.
Matsui, Katsuhiko, 4,297,978, Cl. 123-339.000.
Nagaishi, Hatsuo; and Kita, Toru, 4,297,894, Cl. 73-861.030.
Takaki, Masaoki; Sawano, Hirokazu; Yamanaka, Kunio; Asada, Kazuyoshi; Hideshima, Keiji; and Koyanagi, Haruo, 4,298,958, Cl. 364-900.000.
Niswander, James K.: *See*—
Stattel, Raymond J.; and Niswander, James K., 4,298,987, Cl. 375-106.000.
Nitta, Koichi: *See*—
Kaneko, Fumihiko; Nitta, Koichi; and Saito, Kouichi, 4,298,120, Cl. 206-329.000.
Niwa, Kuniyuki: *See*—
Etoh, Kunihiko; Ishigaki, Tamotsu; and Niwa, Kuniyuki, 4,298,928, Cl. 364-200.000.
Niwa, Tomizo: *See*—
Amano, Shoichi; Miyadoh, Shinji; Takahashi, Saeko; Ezaki, Norio; Niwa, Tomizo; and Yamada, Yujiro, 4,298,599, Cl. 424-119.000.
Nixon, John M., to Edo-Aire Mitchell. Stabilized DC amplifier. 4,298,843, Cl. 330-9.000.
NL Industries, Inc.: *See*—
Page, Enno H., 4,298,051, Cl. 164-72.000.
Nolf, Jean-Marie E., to N.V. Raychem S.A. Branch-off method. 4,298,415, Cl. 156-85.000.
Nomura, Akihiro: *See*—
Yoshimura, Shigeru; Nomura, Akihiro; and Hayakawa, Kimiaki, 4,298,279, Cl. 355-133.000.
Nonoyama, Takao: *See*—
Inada, Masami; Kitamura, Kazuhiko; Ito, Shoji; Nonoyama, Takao; and Tsuji, Riichi, 4,298,020, Cl. 137-315.000.
Noonan, Edward B.: *See*—
Casson, Harold V.; Crabtree, Grant G.; Kindl, Bruno; and Noonan, Edward B., 4,298,416, Cl. 156-87.000.
Norberg, Gayle R.; and Hartung, Lee R., to Control Data Corporation. Monitor and control apparatus. 4,298,860, Cl. 340-825.040.
Norlander, Gosta; Vignotto, Angelo; and Micca, Mario, to Sandvik Aktiebolag; and Aktiebolaget SKF. Rotary drill bit. 4,298,079, Cl. 175-339.000.
Normand Trust: *See*—
Mercier, Jacques H., 4,298,030, Cl. 138-30.000.
Normann, Carl N. Line routing and storing device. 4,297,802, Cl. 43-4.000.
Northern Engineering Industries, Ltd.: *See*—
Emmett, James R., 4,298,696, Cl. 521-26.000.
Northern Telecom Ltd.: *See*—
Kapuscinski, Marek; and Gervais, Michel, 4,298,630, Cl. 427-44.000.
Noto, Takao: *See*—
Oi, Nobuhiro; Aoki, Bunya; Shinozaki, Teizo; Moro, Kanji; Matsunaga, Isao; Noto, Takao; Nebashi, Toshiyuki; Harada, Yusuke; Endo, Hisao; Kimura, Takao; Okazaki, Hiroshi; Ogawa, Haruki; and Shindo, Minoru, 4,298,605, Cl. 424-246.000.
Novikov, Nikolai A.: *See*—
Bochkarev, Ellin P.; Prokopov, Igor V.; Eljutin, Alexandr V.; Belsky, Arkady A.; Baryshnikova, Svetlana M.; Nasyrov, Nail Z.; Novikov, Nikolai A.; Khairulin, Edige R.; Zvyagin, Mikhail S.; Abrjutin, Vladimir N.; Konstantinova, Ljubov I.; Ljubimova, Nina A.; and Gorbacheva, Nadezhda S., 4,298,380, Cl. 75-101.0BE.
Nowack, William C. Industrial oven having air recirculating means for minimizing heat loss. 4,298,341, Cl. 432-64.000.
Noyes, Paul R.: *See*—
Sommerfeld, Eugene G.; and Noyes, Paul R., 4,298,724, Cl. 528-302.000.
Nozaki, Takao; Ito, Takashi; Arakawa, Hideki; Ishikawa, Hajime; and Shinoda, Masaichi, to Fujitsu Limited. Method for forming a nitride insulating film on a silicon semiconductor substrate surface by direct nitridation. 4,298,629, Cl. 427-39.000.
Nozawa, Hideyo; and Naito, Hideshi, to Nippon Kogaku K.K. Aperture device of a lens capable of close proximity flash photography. 4,298,262, Cl. 354-139.000.
NTN Toyo Bearing Company, Limited: *See*—
Kimata, Kei; Yasuda, Yoshinobu; Yoshida, Isamu; and Saruta, Masahiro, 4,297,981, Cl. 123-454.000.
Nuesch, Jakob: *See*—
Schupp, Thomas; Traxler, Peter; and Nuesch, Jakob, 4,298,692, Cl. 435-119.000.
Nuez, Jean-Paul; and Lebesnerais, Gerard, to International Business Machines Corp. Breakdown voltage resistor obtained through a double ion-implantation into a semiconductor substrate, and manufacturing process of the same. 4,298,401, Cl. 148-1.500.
Nutting Truck and Caster Company: *See*—
Funk, Larry J.; and Bluhm, Eugene A., 4,297,950, Cl. 104-172.0BT.
N.V. APR Europe S.A.: *See*—
Bruno, Vogel, 4,298,680, Cl. 430-300.000.
N.V. Raychem S.A.: *See*—
Boettcher, Bodo, 4,298,641, Cl. 428-36.000.
Nolf, Jean-Marie E., 4,298,415, Cl. 156-85.000.
Nypaver, Leonard P.: *See*—
Stroup, John F.; Nypaver, Leonard P.; and Eberst, Dale S., 4,297,901, Cl. 73-862.530.
Obayashi, Tsutomu; and Hiraoka, Hideyuki, to Hiraoka & Co., Ltd. Tarpaulins having great tearing strength. 4,298,645, Cl. 428-110.000.
Oberpichler, Gerd: *See*—
Dorpmund, Heinz; and Oberpichler, Gerd, 4,298,109, Cl. 192-0.044.
Oblad, Alex G.; Shabtai, Joseph; and Ramakrishnan, Rasmasamy, to University of Utah. Hydropyrolysis process for upgrading heavy oils and solids into light liquid products. 4,298,457, Cl. 208-107.000.
Oblinger, Fred: *See*—
Weintraub, Marvin H.; and Oblinger, Fred, 4,298,901, Cl. 361-178.000.
O'Brien, Harold A., Jr.; Hupf, Homer B.; and Wanek, Philip M., to United States of America, Energy. Instantaneous radioiodination of rose bengal at room temperature and a cold kit therefor. 4,298,591, Cl. 424-1.000.
O'Brien, Leo K.: *See*—
Sullivan, Roger M., 4,298,875, Cl. 343-112.0CA.
Occidental Research Corporation: *See*—
Bauer, Hans F., 4,298,350, Cl. 44-1.00C.
DiGiacomo, Peter M.; and Dines, Martin B., 4,298,723, Cl. 528-271.000.
Gabbay, Shlomo M., 4,298,349, Cl. 44-1.00C.
Hard, Robert A., 4,298,437, Cl. 204-70.000.
Sikdar, Subhas K., 4,298,586, Cl. 423-339.000.
Ochiai, Michihiko; Okada, Taiiti; Aki, Osami; Morimoto, Akira; Kawakita, Kenji; and Matsushita, Yoshihiro, to Takeda Chemical Industries, Ltd. Thiazolylacetamido compounds. 4,298,606, Cl. 424-246.000.
Ochiai, Michihiko: *See*—
Natsugari, Hideaki; Mikami, Iwao; and Ochiai, Michihiko, 4,298,607, Cl. 424-246.000.
O'Connor, Brian J. Carrier rack. 4,298,151, Cl. 224-329.000.
Oda, Masahiro: *See*—
Nishihara, Mikio; Oda, Masahiro; and Tsuchimoto, Takamitsu, 4,298,770, Cl. 174-68.500.
Oden, Kenneth W., to Dixie-Narco, Inc. Tandem column vender apparatus. 4,298,138, Cl. 221-115.000.
Oertle, Donald H.: *See*—
Hein, Norman W., Jr.; and Oertle, Donald H., 4,297,885, Cl. 73-587.000.
Office National d'Etudes et de Recherches Aerospaticles: *See*—
Bernard, Claude R.; Daigne, Bernard; and Girard, Francois, 4,298,797, Cl. 250-372.000.
Ogawa, Haruki: *See*—
Oi, Nobuhiro; Aoki, Bunya; Shinozaki, Teizo; Moro, Kanji; Matsunaga, Isao; Noto, Takao; Nebashi, Toshiyuki; Harada, Yusuke; Endo, Hisao; Kimura, Takao; Okazaki, Hiroshi; Ogawa, Haruki; and Shindo, Minoru, 4,298,605, Cl. 424-246.000.
Ogihara, Hirotomo: *See*—
Kudo, Mitsuhiro; Otomo, Shigekazu; Ogihara, Hirotomo; and Aoki, Yoshio, 4,298,381, Cl. 75-124.000.
Ogihara, Masuo; Chimura, Kozo; Shinozaki, Nobuo; and Seki, Yoichi, to Seiko Koki Kabushiki Kaisha. Alarm signaling time detecting device for leaf type digital clock. 4,298,972, Cl. 368-222.000.
Ogiwara, Takeo: *See*—
Ohya, Masaki; Kobayashi, Akio; Ogiwara, Takeo; and Satake, Yoshikatsu, 4,298,710, Cl. 525-5.000.
Oguri, Yasuo: *See*—
Uchida, Mitsuo; Oguri, Yasuo; Saito, Junji; and Kawahara, Tsukasa, 4,298,561, Cl. 264-86.000.
Oguro, Tomokatsu: *See*—
Daikoku, Takahiro; and Oguro, Tomokatsu, 4,298,825, Cl. 315-39.510.
Ohashi, Tetsro; Kitamura, Osamu; Fujii, Hiromu; Mineyuki, Seizo; and Takeuchi, Eiichi, to Nippon Steel Corporation. Process for continuous casting of a slightly deoxidized steel slab. 4,298,050, Cl. 164-468.000.
Ohba, Kenjiro; Izumi, Kaichi; and Yasuda, Shinichiro, to Kao Soap Co., Ltd. Phosphate ester-based fire resistant hydraulic fluid containing an aliphatic polyester. 4,298,489, Cl. 252-78.500.

Ohishi, Tetsuo: *See*—
Tamura, Mitsuhiro; Ohishi, Tetsuo; and Sakurai, Hiroshi, 4,298,522, Cl. 260-45.9QB.
Ohmi, Hidehiko; and Ishibashi, Kazuhisa, to Toyo Seikan Kaisha, Ltd. Apparatus for dispensing and molding lining material into metallic cap shells. 4,298,320, Cl. 425-110.000.
Ohmura, Yasuhiro; Murakami, Yukinobu; and Hidaka, Ryoji, to Mitsubishi Chemical Industries, Ltd. Polyamide resin composition. 4,298,518, Cl. 260-32.6NA.
Ohno, Hideshi: *See*—
Watanabe, Minoru; Kume, Kazunari; Ohno, Hideshi; and Tamaru, Munetaka, 4,297,838, Cl. 368-76.000.
Ohshima, Iwao: *See*—
Nei, Hiromichi; Ohtani, Ryoichi; Ohshima, Iwao; and Horikawa, Yuji, 4,297,873, Cl. 73-61.0LM.
Ohta, Mitsuru: *See*—
Mizuno, Toshiya; Ohta, Mitsuru; and Segawa, Masahiro, 4,298,719, Cl. 526-255.000.
Ohta, Toshiyuki: *See*—
Hamano, Kuniyuki; and Ohta, Toshiyuki, 4,298,962, Cl. 365-182.000.
Ohtani, Ryoichi: *See*—
Nei, Hiromichi; Ohtani, Ryoichi; Ohshima, Iwao; and Horikawa, Yuji, 4,297,873, Cl. 73-61.0LM.
Ohya, Masaki; Kobayashi, Akio; Ogiwara, Takeo; and Satake, Yoshikatsu, to Kureha Kagaku Kogyo Kabushiki Kaisha. Antistatic resin composition. 4,298,710, Cl. 525-5.000.
Oi, Nobuhiro; Aoki, Bunya; Shinozaki, Teizo; Moro, Kanji; Matsunaga, Isao; Noto, Takao; Nebashi, Toshiyuki; Harada, Yusuke; Endo, Hisao; Kimura, Takao; Okazaki, Hiroshi; Ogawa, Haruki; and Shindo, Minoru, to Chugai Seiyaku Kabushiki Kaisha. Cephalosporin derivatives. 4,298,605, Cl. 424-246.000.
Oide, Kunimasa; and Ishii, Hideo, to Daichiku Company, Limited. Connected temporary fastening nails for use in the adhesive installation of ornamental plywood. 4,298,121, Cl. 206-347.000.
Oishi, Kounosuke: *See*—
Yamamoto, Manabu; Murayama, Seiichi; Ito, Masaru; and Oishi, Kounosuke, 4,298,284, Cl. 356-368.000.
Okachi, Ryo: *See*—
Iida, Takao; Shirahata, Kunikatsu; Ishii, Shinzo; Okachi, Ryo; and Nara, Takashi, 4,298,690, Cl. 435-80.000.
Okada, Taiiti: *See*—
Ochiai, Michihiko; Okada, Taiiti; Aki, Osami; Morimoto, Akira; Kawakita, Kenji; and Matsushita, Yoshihiro, 4,298,606, Cl. 424-246.000.
Okada, Takashi, to Sony Corporation. Luminance control circuit for a television receiver. 4,298,885, Cl. 358-39.000.
Okazaki, Hiroshi: *See*—
Oi, Nobuhiro; Aoki, Bunya; Shinozaki, Teizo; Moro, Kanji; Matsunaga, Isao; Noto, Takao; Nebashi, Toshiyuki; Harada, Yusuke; Endo, Hisao; Kimura, Takao; Okazaki, Hiroshi; Ogawa, Haruki; and Shindo, Minoru, 4,298,605, Cl. 424-246.000.
O'Keefe, David B.: *See*—
Rathbun, Donald J.; and O'Keefe, David B., 4,298,956, Cl. 364-900.000.
Okudaira, Sadayuki: *See*—
Suzuki, Keizo; Okudaira, Sadayuki; Nishimatsu, Shigeru; and Kanomata, Ichiro, 4,298,419, Cl. 156-345.000.
Okuno, Yasuo, to Zaidan Hojin Handotai Kenkyu Shinkokai. Light-emitting diode display. 4,298,869, Cl. 340-782.000.
Olashaw, William F., to General Electric Company. Bolted/welded joint and method of perfecting same. 4,298,771, Cl. 174-71.00B.
Oldford, William G., to U.S. Industries, Inc. Apparatus for fabricating pulley rims. 4,297,869, Cl. 72-405.000.
Oleborg, Said, to Navire Cargo Gear International AB. Mobile caisson structure. 4,297,964, Cl. 114-263.000.
Olin Corporation: *See*—
Specht, Steven J.; and Kircher, Morton S., 4,297,923, Cl. 81-57.410.
Olin, Henry; Tallberg, Nils; and Varis, Martti, to Oy Wartsila AB. Sewer system. 4,297,751, Cl. 4-431.000.
Olivari, Humbert. Debris picker and bagger. 4,297,760, Cl. 15-79.00R.
Oliver, Colin C., to EMI Limited. Radiography. 4,298,799, Cl. 250-445.00T.
Olivier, Herve: *See*—
Malafosse, Jean; Girou, Andre; Olivier, Herve; and Dupont, Michel, 4,298,585, Cl. 423-279.000.
Olson, Daniel R.: *See*—
Schroeter, Siegfried H.; and Olson, Daniel R., 4,298,632, Cl. 427-160.000.
Olympus Optical Co., Ltd.: *See*—
Ida, Hideaki; and Fujimori, Ryo, 4,298,449, Cl. 204-299.00R.
Kitagawa, Masahiro, 4,298,261, Cl. 354-139.000.
Takayama, Syuichi, 4,298,260, Cl. 354-50.000.
Tsuda, Hiroshi; Miyashita, Kiyoshi; Nishikawa, Masaji; Shimizu, Akira; and Kasuga, Muneo, 4,298,270, Cl. 355-3.0SH.
Tsuda, Hiroshi; Miyashita, Kiyoshi; Kimura, Katsuhiko; Arima, Heihachi; and Ishimoto, Osamu, 4,298,276, Cl. 355-72.000.
O'Mahony, Gerard. Heteropolar machine for demodulating polyphase voltages interfering among themselves. 4,298,842, Cl. 329-50.000.
Onda, Kenichi; and Amano, Hisao, to Hitachi, Ltd. Gate circuit for gate turn-off thyristor. 4,298,809, Cl. 307-252.00C.
Oohashi, Kenichi: *See*—
Kubo, Kazuhiko; Takahashi, Akira; and Oohashi, Kenichi, 4,298,386, Cl. 501-80.000.
Opfer, Gerald D. Power dissipation regulating circuit for induction motor by supply voltage control in function of phase angle. 4,298,834, Cl. 318-729.000.
Optilon W. Erich Heilmann GmbH: *See*—
Wulz, Helmut, 4,297,770, Cl. 24-205.16R.
Orillion, Michael T., to Dow Chemical Company, The. Corrosion protection for metal surfaces. 4,298,657, Cl. 428-416.000.
Orlowski, Gerald J., to Armour and Company. Molding apparatus. 4,298,326, Cl. 425-219.000.
Orlyansky, Vitaly V.: *See*—
Batalin, Oleg E.; Dykman, Arkady S.; Osadchenko, Alexandr I.; Balkhanova, Galina F.; Belgorodsky, Izrail M.; Nevstruev, Vladimir I.; Radionov, Valery A.; Tulchinsky, Eduard A.; Belyaev, Valentin M.; Smolin, Jury I.; Breiman, Mark I.; Orlyansky, Vitaly V.; Zhirnov, Nikolai Y.; Galibin, Nikolai V.; Troitsky, Adrian P.; and Kovalenko, Vladimir V., 4,298,503, Cl. 252-432.000.
Ortho Pharmaceutical Corporation: *See*—
Heavner, George, 4,298,523, Cl. 260-112.50R.
Osadchenko, Alexandr I.: *See*—
Batalin, Oleg E.; Dykman, Arkady S.; Osadchenko, Alexandr I.; Balkhanova, Galina F.; Belgorodsky, Izrail M.; Nevstruev, Vladimir I.; Radionov, Valery A.; Tulchinsky, Eduard A.; Belyaev, Valentin M.; Smolin, Jury I.; Breiman, Mark I.; Orlyansky, Vitaly V.; Zhirnov, Nikolai Y.; Galibin, Nikolai V.; Troitsky, Adrian P.; and Kovalenko, Vladimir V., 4,298,503, Cl. 252-432.000.
Osakaya, Takayoshi: *See*—
Nishizuka, Hiroshi; Komoriya, Susumu; Morita, Koyo; and Osakaya, Takayoshi, 4,298,273, Cl. 355-61.000.
Osta, Francesco. Device for applying an operating pressure to a roller. 4,297,967, Cl. 118-117.000.
Ostling, Ingemar K., to Sandvik Aktiebolag. Sealing element. 4,298,205, Cl. 277-197.000.
Oswald, Alexis A.; Jermansen, Torris G.; Westner, Andrew A.; and Huang, I-Der, to Exxon Research & Engineering Co. Trihydrocarbyl silyl-substituted alkyl diaryl phosphine transition metal complexes and their use as homogeneous catalysts. 4,298,541, Cl. 260-429.00R.
Otomo, Shigekazu: *See*—
Kudo, Mitsuhiro; Otomo, Shigekazu; Ogihara, Hirotomo; and Aoki, Yoshio, 4,298,381, Cl. 75-124.000.
Otsuka Pharmaceutical Co., Ltd.: *See*—
Nishi, Takao; Ueda, Hiraki; and Nakagawa, Kazuyuki, 4,298,739, Cl. 546-158.000.
Ott, Paul W.: *See*—
Van Steenwyk, Donald H.; Cash, John R.; and Ott, Paul W., 4,297,790, Cl. 33-313.000.
Owens-Corning Fiberglas Corporation: *See*—
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Peterson, Harold J., to Farmers Pride Cheese, Inc. Method of making cheese having zones of different characteristics. 4,298,618, Cl. 426-36.000.

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Fluegel, Dale A., 4,298,939, Cl. 364-421.000.
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Pichel Industries, Inc.: *See—*
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Pickett, John A.: *See—*
Laws, Derek R. J.; Bath, Nigel A.; Ennis, Colin S.; Pickett, John A.; and Wheldon, Alfred G., 4,298,626, Cl. 426-600.000.

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Pirovano, Dante, to Industrie Pirelli S.p.A. Device for applying the elastomeric filler to the bead core of a tire. 4,298,421, Cl. 156-460.000.

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Plath, Peter; Rohr, Wolfgang; Wuerzer, Bruno; and Becker, Rainer, to BASF Aktiengesellschaft. Pyrazole ether derivatives. 4,298,749, Cl. 548-377.000.

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Friedman, Harvey S., 4,298,267, Cl. 354-304.000.
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Bielska-Lewandowska, Halina; Irisova, Natalija; Jung, Grzegorz; Lewandowski, Stanislaw J.; Prohorov, Aleksandr; Sobolewski, Roman; and Vinogradov, Eugenij, 4,298,990, Cl. 455-325.000.

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Pontone, Louis J. Reusable wall fastener. 4,298,298, Cl. 411-342.000.

Pontoppidan, Michael, to S.I.B.E. Societe Industrielle de Brevets et d'Etudes. Carburetors for internal combustion engines. 4,298,548, Cl. 261-34.00R.

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Post, John E., to Carrier Corporation. Air conditioning system and control therefor. 4,298,164, Cl. 236-49.000.

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Decker, Forrest W.; and Peternel, Jacob R., 4,298,790, Cl. 235-92.0SB.
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Maaghul, John, 4,298,653, Cl. 428-378.000.
Savolskis, Edward P.; and Scott, Walter W., 4,298,374, Cl. 65-335.000.
Schimmel, Karl F.; Seiner, Jerome A.; Dowbenko, Rostyslaw; and Christenson, Roger M., 4,298,511, Cl. 260-29.2TN.
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Pressl, Klaus A., to Sohne, Jakob Pressl. Grease gun. 4,298,144, Cl. 222-256.000.

Prevorsek, Dusan C.; and Kwon, Young D., to Allied Corporation. Measuring coefficient of radial damping of tire wall segment. 4,297,878, Cl. 73-146.000.

Price, Robert T., to RJM Industries, Inc. Roller skate wheel with self-contained generator. 4,298,910, Cl. 362-35.000.

Prichard, William W.: *See*—
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Prior, Herbert E. Convertible trestle leg assembly. 4,298,096, Cl. 182-186.000.

Prior, William C.; and Brown, Keith E., to Kinetico, Inc. Control valve for water softeners. 4,298,025, Cl. 137-624.140.

Pritchett, William C., to Atlantic Richfield Company. Coupling means for horizontal vibrator. 4,298,086, Cl. 181-113.000.

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MacKenzie, Michael C.; and Fischer, Reinhold S., 4,298,312, Cl. 415-118.000.

Putzke, Dwayne H., to CX Corporation. Strip cutter having rotatable cutting blade and strip deflecting means. 4,297,930, Cl. 83-156.000.

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Quarles, James R. Hairpin cotter key. 4,298,299, Cl. 411-514.000.

Quella, Ferdinand; and Pape, Heinz, to Siemens Aktiengesellschaft. Method and device for collecting light utilizing a light trap. 4,298,802, Cl. 250-484.000.

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Racor Industries, Inc.: *See*—
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Radek, John R., to Ready Metal Manufacturing Company. Cup dispenser. 4,298,139, Cl. 221-198.000.

Radionov, Valery A.: *See*—
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Raffelsiefer, Kurt; Kurth, Herman W.; and Haberle, Fritz, to Arn. Kiekert Soehne and Daimler-Benz Aktiengesellschaft. Door lock, especially for motor vehicle doors. 4,298,223, Cl. 292-216.000.

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Rampel, Guy, to General Electric Company. Electrode coating composed of copolymers derived from diacetone acrylamide. 4,298,667, Cl. 429-248.000.

Ramunas, Valdas S., to Acme-Cleveland Corporation. Object separator. 4,298,141, Cl. 221-251.000.

Randell, Arthur A., to Coal Industry (Patents) Limited. Method of heat treating a material. 4,298,339, Cl. 432-15.000.

Ranini, Daniel G.: *See*—
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Rathmell, William G.: *See—*
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Credelle, Thomas L.; and Gange, Robert A., 4,298,819, Cl. 313-422.000.
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McCandless, Harry E., 4,298,818, Cl. 313-417.000.
Scott, Howard M., 4,298,892, Cl. 358-190.000.
Read, David M., to Minnesota Mining and Manufacturing Company. Steam-formaldehyde sterilization indicator. 4,298,569, Cl. 422-27.000.
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Radek, John R., 4,298,139, Cl. 221-198.000.
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Hahn, Klaus; Hinselmann, Klaus; Halbritter, Klaus; Rebafka, Walter; and Weber, Heinz, 4,298,702, Cl. 521-79.000.
Reclamet, Inc.: *See—*
Dudley, Robert H., 4,298,476, Cl. 210-373.000.
Reddick, Cornelius. Device for rear view vision for spectacles. 4,298,254, Cl. 351-50.000.
Redmond, John D., Jr., to Gates Rubber Company, The. Reinforced belt splice. 4,298,343, Cl. 474-255.000.
Reed, Kingstone L. H., to Koolatron Industries, Inc. Wall mounted thermoelectric refrigerator. 4,297,850, Cl. 62-3.000.
Rees, James D.; Altfather, Kenneth W., Jr.; Lama, William L.; and Ozern, Donna U. Variable density filter for a multi-magnification copying device. 4,298,274, Cl. 355-71.000.
Regalbuto, John A.; and Christopher, Glenn B., to Jet Research Center, Inc. Methods and apparatus for severing conduits. 4,298,063, Cl. 166-55.000.
Rehage, Ted A.: *See—*
Bigelow, George A.; Rehage, Ted A.; and Shook, Frankie S., 4,298,954, Cl. 364-900.000.
Rehner, Helmut; and Rittersdorf, Walter, to Boehringer Mannheim GmbH. Control reagent for test strips for determining urobilinogen in urine. 4,298,498, Cl. 252-408.000.
Reifers, Richard F.; and Lord, Henry A., to Diamond International Corporation. Nestable and denestable molded egg cartons. 4,298,156, Cl. 229-2.50R.
Reiffert, Jurgen: *See—*
Gerhardt, Werner; Wehle, Volker; Syldatk, Andreas; Rogall, Gabriele; Reiffert, Jurgen; and Conrad, Jens, 4,298,568, Cl. 422-16.000.
Remajzl, Karel: *See—*
Homola, Jaroslav; Remajzl, Karel; and Prokes, Milan, 4,298,882, Cl. 357-38.000.
Reneau, Daniel L., to Zenith Radio Corporation. Chroma amplifier and color killer. 4,298,884, Cl. 358-26.000.
Research Against Cancer, Inc.: *See—*
Parks, Leon C., 4,298,006, Cl. 128-309.000.
Research Corporation: *See—*
Doyle, Ronald J.; Keller, Kenneth F.; and Schaefer, Robert L., 4,298,689, Cl. 435-34.000.
Research Foundation of the City University of New York: *See—*
Gafney, Harry D., 4,298,439, Cl. 204-157.10W.
Rheindt, Kurt: *See—*
Grunert, Wolfgang; Huber, Johann; and Rheindt, Kurt, 4,298,184, Cl. 251-357.000.
Rhodia AG: *See—*
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Rhone-Poulenc Industries: *See—*
Daniel, Jean-Claude; Grossoleil, Jacques; and Roullet, Robert, 4,298,637, Cl. 427-372.200.
Ricci, Giovanni B. Modular prefabricated semi-panels to build inside or bearing walls by means of auxiliary connecting spacers. 4,297,824, Cl. 52-568.000.
Rice, Wayne K.: *See—*
Singh, Laxman; and Rice, Wayne K., 4,298,622, Cl. 426-254.000.
Richardson Chemical Company: *See—*
Greene, Joseph L., 4,298,404, Cl. 148-6.14A.
Richardson, John G.; and Soldat, Robert W., to Envirotronics. Electronic multi-zone timed temperature control apparatus. 4,298,163, Cl. 236-46.00R.
Richardson, Neil G.: *See—*
Limonchik, Abe; and Richardson, Neil G., 4,298,396, Cl. 106-273.00R.
Richardson, William C.: *See—*
Berglund, Neil C.; Kempke, William G.; and Richardson, William C., 4,298,927, Cl. 364-200.000.
Richman, Paul, to Standard Microsystems Corp. Hermetic plastic dual-in-line package for a semiconductor integrated circuit. 4,298,769, Cl. 174-52.0FP.
Richter Gedeon Vegyeszeti Gyar RT: *See—*
Jovanovics, Karola; and Gorog, Sandor, 4,298,525, Cl. 260-244.400.
Richter, Hans. Cycloidic gear. 4,297,920, Cl. 74-804.000.
Richter, Hans. Apparatus for detecting forces directing the movement of a manipulating instrument. 4,298,308, Cl. 414-730.000.
Rickenbacker, James E., to Exxon Production Research Company. Method and apparatus for testing the impedances of geophone channels. 4,298,969, Cl. 367-76.000.
Ricoh Company, Ltd.: *See—*
Kaneko, Yutaka; and Fukuda, Mitsuhisa, 4,298,244, Cl. 350-3.780.
Nakamura, Haruka, 4,298,978, Cl. 370-92.000.
Ridings, Robert P.: *See—*
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Riedle, Rudolf: *See—*
Schinabeck, Anton; Zeller, Norbert; Lindner, Tassilo; Engelsberger, Georg; and Riedle, Rudolf, 4,298,753, Cl. 556-415.000.
Riehl, Fred, to Robertshaw Controls Company. Pilot burner ignition means and method of making the same. 4,298,336, Cl. 431-264.000.
Rieter Machine Works, Ltd.: *See—*
Fluckiger, Peter; and Schefer, Kurt, 4,298,171, Cl. 242-18.00A.
Rijnders, Willem, to Hunter Douglas International, N.V. Panelled ceiling. 4,297,822, Cl. 52-484.000.
Riker Laboratories, Inc.: *See—*
Scherrer, Robert A.; and Stern, Richard M., 4,298,532, Cl. 260-346.220.
Riley, Richard L.: *See—*
Condouris, George A.; Yelnosky, John; Riley, Richard L.; Won, Chong M.; Douglas, George H.; and Studt, William L., 4,298,608, Cl. 424-249.000.
Riordan, William J.; and Cunha, Richard A., to Walter Kidde and Company, Inc. Fuel burner control apparatus. 4,298,335, Cl. 431-25.000.
Ripny, Viktor N.: *See—*
Anikeev, Yakov F.; Panikov, Nikolai N.; and Ripny, Viktor N., 4,297,886, Cl. 73-642.000.
Ritchie, John G.: *See—*
Thankachan, Chacko; Ritchie, John G.; Sahayada, Eugene; and Sengupta, Asok, 4,298,658, Cl. 428-425.100.
Ritschel, Josef, to Rhodia AG. Device for transporting and storing spools and particularly yarn spools. 4,298,303, Cl. 414-401.000.
Ritter, Allen M.: *See—*
Dinger, Edward H.; and Ritter, Allen M., 4,298,810, Cl. 307-252.00N.
Ritter, Kent E., to Air Preheater Company, Inc., The. Actuated sector plate. 4,298,055, Cl. 165-9.000.
Rittersdorf, Walter: *See—*
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Ritzi, Emil W., to Biphase Energy Systems. Two-phase reaction turbine. 4,298,311, Cl. 415-80.000.
RJM Industries, Inc.: *See—*
Price, Robert T., 4,298,910, Cl. 362-35.000.
Robert Bosch GmbH: *See—*
Haubner, Georg; Wesemeyer, Jurgen; and Schrumpf, Hans, 4,298,930, Cl. 364-200.000.
Heitmann, Jurgen, 4,298,896, Cl. 360-11.000.
Roberts, Eugene L., to United States of America, Army. Adaptive steerable null antenna processor. 4,298,873, Cl. 343-100.0SA.
Robertshaw Controls Company: *See—*
Riehl, Fred, 4,298,336, Cl. 431-264.000.
Robertson, John M.: *See—*
Bongers, Piet F.; van Tol, Maurits W.; and Robertson, John M., 4,298,820, Cl. 313-463.000.
Robins, Ronald F.; and Lindre, Jaan, to Ford Motor Company. Brake wear indicator system. 4,298,857, Cl. 340-52.00A.
Robinson, Graham E., to Imperial Chemical Industries Limited. Manufacturing process for preparing disubstituted (N-cyanoimido) carbonates. 4,298,544, Cl. 260-453.0RW.
Roccaforte, Harry I.; and Hanko, Jimmy J., to Champion International Corporation. Carton core retainers. 4,298,123, Cl. 206-396.000.
Rockwell International Corporation: *See—*
Palovcik, John, 4,298,155, Cl. 228-114.000.
Rode, Jonathan P., 4,298,887, Cl. 358-113.000.
Rode, Jonathan P., to Rockwell International Corporation. Non-uniformity correction in a multielement detector array. 4,298,887, Cl. 358-113.000.
Roderick, John J.: *See—*
Allan, John L. H.; Finestone, Arnold B.; and Roderick, John J., 4,298,521, Cl. 260-45.90R.
Rodgers, William E., to Hughes Aircraft Company. Sidelobe blanking system. 4,298,872, Cl. 343-100.0LE.
Rodriguez, Juan G.: *See—*
Mehring, Jeffrey S.; Sayen, Ronald J.; Schara, Robert E.; Stocker, Charles T.; and Rodriguez, Juan G., 4,298,624, Cl. 426-532.000.
Rodriguez, Rudolph. Catapult device and projectile therefore. 4,297,985, Cl. 124-22.000.
Roes, Wilhelmus F. M.: *See—*
Cordes, Johan H.; and Roes, Wilhelmus F. M., 4,298,519, Cl. 260-33.8UA.
Rogall, Gabriele: *See—*
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Rohrig, Adalbert: *See—*
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Roland, Magnus A.: *See*—
Grahn, Sven-Ake; Roland, Magnus A.; and Eriksson, Carl L., 4,297,911, Cl. 280-777.000.
Roller, Max F. Roll-up divider. 4,298,048, Cl. 160-243.000.
Rolls-Royce Limited: *See*—
Chapman, John F., 4,298,090, Cl. 181-286.000.
Rolstad, Erik; Korpas, Thor-Harrald; Leyse, Robert H.; and Smith, Robert D., to Scandpower A/S. Apparatus for determining the local power generation rate in a nuclear reactor fuel assembly. 4,298,430, Cl. 376-247.000.
Romanski, John G., to United States of America, Air Force. Method and apparatus for augmenting binary patterns. 4,298,858, Cl. 340-146.3MA.
Ronel, Samuel H.; D'Andrea, Mark J.; Dobelle, William H.; Klomp, Gregory F.; and Hashiguchi, Hiroshi, to National Patent Development Corporation. Porous hydrophilic materials, chambers therefrom, and devices comprising such chambers and biologically active tissue and methods of preparation. 4,298,002, Cl. 128-260.000.
Rooney, Clarence S.: *See*—
Cragoe, Edward J., Jr.; Rooney, Clarence S.; and Williams, Haydn W. R., 4,298,743, Cl. 548-203.000.
Ropp, Walter S.: *See*—
Majewicz, Thomas G.; and Ropp, Walter S., 4,298,728, Cl. 536-96.000.
Rosenberry, George M., Jr.: *See*—
Liebermann, Howard H.; Frischmann, Peter G.; and Rosenberry, George M., Jr., 4,298,659, Cl. 428-592.000.
Rosenthal Technik AG: *See*—
Krauth, Axel; Maier, Horst R.; Phlmann, Hans-Juergen; Foerster, Siegfried; and Kleeman, Manfred, 4,298,059, Cl. 165-166.000.
Ross, David S.; and Blessing, James E., to United States of America, Energy. Alcohols as hydrogen-donor solvents for treatment of coal. 4,298,450, Cl. 208-8.0LE.
Rossler, Eleanor J.: *See*—
Przybyla, Franciszek J.; and Rossler, Eleanor J., 4,298,506, Cl. 252-518.000.
Roth, Karl: *See*—
Sappok, Reinhard; Guellich, Fritz; Roth, Karl; and Wiesenberger, Alois, 4,298,526, Cl. 260-314.500.
Rottmaier, Ludwig: *See*—
Lewalter, Jurgen; Rottmaier, Ludwig; Merten, Rudolf; Zecher, Wilfried; Dunwald, Willi; and Schulte, Bernhard, 4,298,515, Cl. 260-30.40N.
Roullet, Robert: *See*—
Daniel, Jean-Claude; Grossoleil, Jacques; and Roullet, Robert, 4,298,637, Cl. 427-372.200.
Rowe, Don H., to GTE Products Corporation. Voltage regulator with temperature dependent output. 4,298,835, Cl. 323-281.000.
Rozet, Vladimir E.: *See*—
Avdeenko, Boris K.; Bronfman, Aron I.; Vitkin, Alexandr L.; Zelentsov, Boris N.; Kinevsky, Valery N.; and Rozet, Vladimir E., 4,298,900, Cl. 361-127.000.
Rozmus, Walter J., to Kelsey-Hayes Company. Powder dispensing assembly. 4,298,168, Cl. 239-659.000.
Ruark, Bruce L.: *See*—
McCarty, William J.; and Ruark, Bruce L., 4,297,854, Cl. 62-325.000.
McCarty, William J.; and Ruark, Bruce L., 4,297,855, Cl. 62-325.000.
Ruehle, William H., to Mobil Oil Corporation. Removal of surface layer anomaly effects. 4,298,966, Cl. 367-50.000.
Ruehle, William H.; and Hodge, John D., to Mobil Oil Corporation. Digital reflection searching and section plotting. 4,298,968, Cl. 367-59.000.
Ruelle, Gilbert: *See*—
Damiron, Rene; Gillet, Roger; Heuillard, Jean-Francois; and Ruelle, Gilbert, 4,298,812, Cl. 310-61.000.
Rumberger, Earl E.; and Kelly, Frank M., to Aluminum Company of America. Method and apparatus for removing liners from metal closures. 4,297,778, Cl. 29-426.400.
Runyan, Steven R.: *See*—
Irvin, Ronaid D.; Runyan, Steven R.; and Sherlock, Hugh P., 4,298,976, Cl. 369-282.000.
Ruschke, Ricky R., to Baxter Travenol Laboratories, Inc. Gas separating and venting filter. 4,298,358, Cl. 55-185.000.
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Barbakadze, Dzhondo F.; Mindeli, Mamuka S.; Macharashvili, Petr G.; Rusidze, Vazha V.; and Suladze, Otari N., 4,298,192, Cl. 266-218.000.
Russ, Peter; and Jansen, Heinz, to Deutsche Industrieanlagen GmbH Werk Hermann Kolb Maschinenfabrik Koeln. Machine tool with offset compensation. 4,297,926, Cl. 82-9.000.
Rust, Robert C.: *See*—
Wright, Thomas C.; Hudrlik, Terrence R.; Mills, Perry A.; Rust, Robert C.; and Wallner, Thomas G., 4,298,007, Cl. 128-419.0PG.
Rutsch, Peter W.; and Brehm, Michael, to Carl Freudenberg, Firma. Method for matched die molding a fiber reinforced polyurethane foam molded product. 4,298,556, Cl. 264-46.600.
Ryan, William C., Jr.: *See*—
Hargest, Thomas S., III; and Ryan, William C., Jr., 4,298,001, Cl. 128-247.000.
S.I.B.E. Societe Industrielle de Brevets et d'Etudes: *See*—
Pontoppidan, Michael, 4,298,548, Cl. 261-34.00R.
Saab-Scania Aktiebolag: *See*—
Grahn, Sven-Ake; Roland, Magnus A.; and Eriksson, Carl L., 4,297,911, Cl. 280-777.000.
Sack, Werner, to Jenaer Glaswerk Schott & Gen. Alkali-free sealing glasses for molybdenum. 4,298,388, Cl. 501-15.000.
Saegusa, Takashi, to Nippon Kogaku K.K. Device for driving a display element having a memorizing property. 4,298,870, Cl. 340-785.000.
Safe-T Pacific Company: *See*—
Stanley, Lorne R., 4,298,142, Cl. 221-304.000.
Safetran Systems Corporation: *See*—
Cogdill, William F., 4,298,225, Cl. 294-118.000.
Sagishima, Takayuki: *See*—
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Sahayada, Eugene: *See*—
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Saiji, Mituhiro: *See*—
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Saiki, Yukihiro; Kumazawa, Eitaro; and Ishioka, Yozo, to Snow Brand Milk Products Co., Ltd. Apparatus for supplying materials to belt type continuous vacuum dryer. 4,297,793, Cl. 34-56.000.
St. Anthony Hospital Systems: *See*—
Natitus, Donald P.; and Carlson, Curt T., 4,298,863, Cl. 340-573.000.
St. Georgiev, Vasil: *See*—
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Saito, Junji: *See*—
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Saito, Masao; Hosokawa, Motoyuki; Kawakami, Takamasa; and Murayama, Yuko, to Mitsubishi Gas Chemical Company, Inc. Process for producing phthalonitrile. 4,298,545, Cl. 260-465.00H.
Saito, Motoyuki, to Citizen Watch Co., Ltd. Structure for coupling back cover with case band in wrist watch. 4,298,973, Cl. 368-276.000.
Saito, Norio. Composition useful for inhibiting adhesion and propagation of undesirable algae and/or shellfish on articles. 4,297,803, Cl. 43-7.000.
Saito, Shoji; and Nagashima, Mitsuo. Pot lid. 4,298,131, Cl. 220-231.000.
Saito, Toshiaki: *See*—
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Sakai, Masakado: *See*—
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Sakauye, Randall T.; Marlow, John V.; Laurie, Gordon H.; and Seymour, Theodore J., to Cominco Ltd. Asymmetrical shaping of slit segments of meshes formed in deformable strip. 4,297,866, Cl. 72-186.000.
Sakurada, Shuroku; Nakashima, Yoichi; Kojima, Isao; Yagi, Hideyuki; Kariya, Tadaaki; and Sugiyama, Masayoshi, to Hitachi, Ltd. Semiconductor device with double moat and double channel stoppers. 4,298,881, Cl. 357-38.000.
Sakurai, Hiroshi: *See*—
Tamura, Mitsuhiro; Ohishi, Tetsuo; and Sakurai, Hiroshi, 4,298,522, Cl. 260-45.9QB.
Salters, Roelof H. W.; and Koomen, Joannes J. M., to Signetics Corporation. MOS Voltage divider. 4,298,811, Cl. 307-296.00R.
Salvat, Francois: *See*—
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Samis, James M.; Waechter, Walter C.; and James, Ronald D., to Thermonetics, Inc. Converting animal wastes to useful products. 4,298,621, Cl. 426-55.000.
Sams, Jack G., to International Business Machines Corporation. Serial storage subsystem for a data processor. 4,298,932, Cl. 364-200.000.
Sandler, Stanley R., to Pennwalt Corporation. Tetrahalophthalates as flame retardant plasticizers for halogenated resins. 4,298,517, Cl. 260-31.8HA.
Sandvik Aktiebolag: *See*—
Norlander, Gosta; Vignotto, Angelo; and Micca, Mario, 4,298,079, Cl. 175-339.000.
Ostling, Ingemar K., 4,298,205, Cl. 277-197.000.
Sandvik Conveyor GmbH: *See*—
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Sangamo Weston, Inc.: *See*—
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Sano, Takezo; Inoue, Tadanori; and Uemura, Yukikazu, to Sumitomo Chemical Company, Ltd. Resin original pattern plate and method for transferring relieved pattern thereof to thermoplastic resin material. 4,297,945, Cl. 101-395.000.
Sanyo Chemical Industries, Ltd.: *See*—
Genjida, Fumihide; Kawakatsu, Kunio; and Ii, Motohiko, 4,298,487, Cl. 252-75.000.
Sappok, Reinhard; Guellich, Fritz; Roth, Karl; and Wiesenberger, Alois, to BASF Aktiengesellschaft. Preparation of easily dispersible and deeply colored pigmentary forms. 4,298,526, Cl. 260-314.500.

Sarda, Jean-Paul: *See*—
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Sartoretto, Paul; and Tao, Kak-Yuen, to W. A. Cleary Chemical Corporation. Urea formaldehyde dispersions modified with higher aldehydes. 4,298,512, Cl. 260-29.40R.

Saruta, Masahiro: *See*—
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Sasaki, Reiichi: *See*—
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Sasaki, Shinichi. Apparatus for measuring a percentage of moisture and weighing of a sheet-like object. 4,297,874, Cl. 73-73.000.

Sasayama, Ta¹cao; Nishimura, Yutaka; Sakamoto, Shinichi; and Miki, Masayuki, to Hitachi, Ltd. Hot-wire flow rate measuring apparatus. 4,297,881, Cl. 73-204.000.

Satake, Yoshikatsu: *See*—
Ohya, Masaki; Kobayashi, Akio; Ogiwara, Takeo; and Satake, Yoshikatsu, 4,298,710, Cl. 525-5.000.

Satchell, Donald P., Jr., to Phelps Dodge Corporation. Apparatus and method for visually monitoring an ion exchange fluidized bed. 4,298,466, Cl. 210-94.000.

Sato, Isao; Kato, Fumio; Uchiyama, Yoshihiro; Iizuka, Nobuyuki; and Hata, Tsuneyuki, to Hitachi, Ltd. Combustor of gas turbine with features for vibration reduction and increased cooling. 4,297,843, Cl. 60-39.320.

Sato, Tadashi; and Tanaka, Keiji. Method and device for cleaning photosensitive screen in an image forming apparatus. 4,298,268, Cl. 355-3.0SC.

Sato, Yasuhiro: *See*—
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Satomura, Masato: *See*—
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Sattelmeyer, Richard: *See*—
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Sauer, Gerhard: *See*—
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Saus, J. Arthur; and McCartney, Larry P., to Intex Products, Inc. Process for producing iron phosphate coatings at ambient temperature. 4,298,405, Cl. 148-6.15R.

Savolskis, Edward P.; and Scott, Walter W., to PPG Industries, Inc. Apparatus for improving glass melting by perforating batch layer. 4,298,374, Cl. 65-335.000.

Sawada, Yoshio: *See*—
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Scandpower A/S: *See*—
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Schachar, Ronald A.; and Levy, Norman S. Surgical method for altering the curvature of the cornea of rabbits. 4,298,004, Cl. 128-305.000.

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Schara, Robert E.: *See*—
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Schave, Richard D., to Libbey-Owens-Ford Company. Laser system for aligning conveyor rolls. 4,298,281, Cl. 356-138.000.

Scheepswerf Stapel B.V.: *See*—
Amelink, Joost, 4,298,219, Cl. 285-24.000.

Schefer, Kurt: *See*—
Fluckiger, Peter; and Schefer, Kurt, 4,298,171, Cl. 242-18.00A.

Schenk, Hans-Joachim: *See*—
Ashtheimer, Ludwig; Schenk, Hans-Joachim; and Schwochau, Klaus, 4,298,577, Cl. 423-6.000.

Schering, Aktiengesellschaft: *See*—
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Schering Corporation: *See*—
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Scherrer, Robert A.; and Stern, Richard M., to Riker Laboratories, Inc. 3-Naphthyl benzofurans. 4,298,532, Cl. 260-346.220.

Schieser, Warren J.; and Vickers, Stanley E., to Liqui-Box Corporation. Separator and feeder for a strip of flexible bags. 4,297,929, Cl. 83-110.000.

Schiller, Wolf-Dieter: *See*—
Krull, Walther; Bekaan, Alfred; and Schiller, Wolf-Dieter, 4,298,362, Cl. 55-304.000.

Schimmel, Karl F.; Seiner, Jerome A.; Dowbenko, Rostyslaw; and Christenson, Roger M., to PPG Industries, Inc. Urethane rheology modifiers and compositions containing same. 4,298,511, Cl. 260-29.2TN.

Schinabeck, Anton; Zeller, Norbert; Lindner, Tassilo; Engelsberger, Georg; and Riedle, Rudolf, to Wacker-Chemie GmbH. Continuous process for preparing silanes and siloxanes having SiOC groups. 4,298,753, Cl. 556-415.000.

Schlusnus, Karl-Heinz: *See*—
Krenzer, Paul; Peters, Franz-Josef; Schlusnus, Karl-Heinz; and Wahl, Hans J., 4,298,785, Cl. 219-124.340.

Schmall, Karl-Heinz. Arrangement for measuring the distance between a metallic workpiece and a processing tool. 4,298,784, Cl. 219-124.020.

Schmidt, George F.; and Weber, Robert E., to Kimberly-Clark Corporation. Alkaline battery, electrolyte absorber therefor. 4,298,668, Cl. 429-250.000.

Schmidt, Paul J.; and Hung, William M., to Sterling Drug Inc. Carbonless duplicating and marking systems. 4,298,215, Cl. 282-27.500.

Schmitz, Gerd; and Hintsch, Otto, to Sulzer Brothers Limited. Brake system for a textile machine. 4,298,107, Cl. 192-12.00D.

Schmukler, Seymour: *See*—
Machonis, John, Jr.; Schmukler, Seymour; Zeitlin, Robert J.; and Shida, Mitsuzo, 4,298,712, Cl. 525-74.000.

Schneider, Urban A.; Monley, Robert E.; Nelson, Robert L.; and Glatthorn, Raymond H., to Westinghouse Electric Corp. Deep narrow groove tungsten inert gas shielded welding process. 4,298,783, Cl. 219-75.000.

Schoennagel, Hans-Juergen; and Zahner, John C., to Mobil Oil Corporation. Coal conversion. 4,298,453, Cl. 208-10.000.

Schreck, Carl E.: *See*—
McGovern, Terrence P.; and Schreck, Carl E., 4,298,612, Cl. 424-267.000.

Schrecongost, Ray B., to Marmon Company. Divider keyer circuit for synthesis organ. 4,297,935, Cl. 84-1.010.

Schreiber, Ronald S., to Colgate-Palmolive Company. Method for retarding gelation of bicarbonate-carbonate-silicate crutcher slurries. 4,298,493, Cl. 252-135.000.

Schroeder, Charles F.: *See*—
Froberg, Magnus L.; and Schroeder, Charles F., 4,298,369, Cl. 65-27.000.

Schroeter, Siegfried H.; and Olson, Daniel R., to General Electric Company. Silicone coated abrasion resistant polycarbonate article. 4,298,632, Cl. 427-160.000.

Schrumpf, Hans: *See*—
Haubner, Georg; Wesemeyer, Jurgen; and Schrumpf, Hans, 4,298,930, Cl. 364-200.000.

Schuchardt, Donald W., to Western Electric Company, Incorporated. Metallized resistor and methods of manufacturing and adjusting the resistance of same. 4,298,856, Cl. 338-195.000.

Schulte, Bernhard: *See*—
Lewalter, Jurgen; Rottmaier, Ludwig; Merten, Rudolf; Zecher, Wilfried; Dunwald, Willi; and Schulte, Bernhard, 4,298,515, Cl. 260-30.40N.

Schulze, Heinz; Zimmerman, Robert L.; and Naylor, Carter G., to Texaco Development Corp. Aminated alkoxylated aliphatic alcohol salts as polyisocyanurate catalysts. 4,298,708, Cl. 521-115.000.

Schumacher, John C.; and Lagendijk, Andre, to J. C. Schumacher Co. Method of shipping and using semiconductor liquid source materials. 4,298,037, Cl. 141-1.000.

Schupp, Thomas; Traxler, Peter; and Nuesch, Jakob, to Ciba-Geigy Corporation. Fermentation process for producing a rifamycin derivative. 4,298,692, Cl. 435-119.000.

Schwartz, Albert B.: *See*—
Butter, Stephen A.; Chester, Arthur W.; and Schwartz, Albert B., 4,298,695, Cl. 518-720.000.

Schwarz, Gerd-Ulrich; Kiehs, Karl; Boell, Walter; and Adolphi, Heinrich, to BASF Aktiengesellschaft. Substituted 2,3-dihydrobenzofurylmethyl esters, their use in pest control, and pest control agents containing these compounds. 4,298,615, Cl. 424-285.000.

Schwarz, Josef: *See*—
Kuhnle, Ernst; and Schwarz, Josef, 4,297,875, Cl. 73-862.620.

Schwarz, Otto; Linnau, Yendra; Loblich, Franz; and Seelich, Thomas, to Immuno Aktiengesellschaft fur chemisch-medizinische Produkte. Tissue adhesive. 4,298,598, Cl. 424-101.000.

Schwarz, Richard A.: *See*—
Hergenrother, William L.; Schwarz, Richard A.; Ambrose, Richard J.; and Hayes, Robert A., 4,298,707, Cl. 521-95.000.

Schwehr, Gregory D.: *See*—
Heitman, Christopher J.; and Schwehr, Gregory D., 4,298,801, Cl. 250-447.000.

Schwochau, Klaus: *See*—
Ashtheimer, Ludwig; Schenk, Hans-Joachim; and Schwochau, Klaus, 4,298,577, Cl. 423-6.000.

SCM Corporation: *See*—
Ehmann, William J.; and Johnson, Walter E., Jr., 4,298,762, Cl. 568-433.000.

Scott, Howard M., to RCA Corporation. Switching regulator with independent feedback path filter. 4,298,892, Cl. 358-190.000.

Scott, Walter W.: *See*—
Savolskis, Edward P.; and Scott, Walter W., 4,298,374, Cl. 65-335.000.

Scovill Inc.: *See*—
Gauthier, Henry J., 4,297,954, Cl. 112-104.000.

Sears, Barry; and Yesair, David W., to Arthur D. Little, Inc. Xenobiotic delivery vehicles, method of forming them and method of using them. 4,298,594, Cl. 424-19.000.

Sebulke, Joachim A.: *See*—
Bischoff, Jurgen H.; and Sebulke, Joachim A., 4,298,840, Cl. 324-365.000.

Seelich, Thomas: *See*—
Schwarz, Otto; Linnau, Yendra; Loblich, Franz; and Seelich, Thomas, 4,298,598, Cl. 424-101.000.

Seffens, David E., to H. Jack Flanders Co. Log transport system. 4,298,043, Cl. 144-136.00R.

Segawa, Masahiro: *See*—
Mizuno, Toshiya; Ohta, Mitsuru; and Segawa, Masahiro, 4,298,719, Cl. 526-255.000.

Seidel, Dietrich; Wieland, Heinrich; and Molinari, Ewald, to Immuno Aktiengesellschaft fur chemisch-medizinische Produkte. Method of preserving the electrophoretic properties of lipoproteins. 4,298,441, Cl. 204-180.00G.

Seiko Koki Kabushiki Kaisha: *See*—
Ogihara, Masuo; Chimura, Kozo; Shinozaki, Nobuo; and Seki, Yoichi, 4,298,972, Cl. 368-222.000.

Seiner, Jerome A.: *See*—
Schimmel, Karl F.; Seiner, Jerome A.; Dowbenko, Rostyslaw; and Christenson, Roger M., 4,298,511, Cl. 260-29.2TN.

Seki, Yoichi: *See*—
Ogihara, Masuo; Chimura, Kozo; Shinozaki, Nobuo; and Seki, Yoichi, 4,298,972, Cl. 368-222.000.

Seldeen, Richard. Pistol charging holster. 4,298,150, Cl. 224-243.000.

Sellers, Gregory J.: *See*—
Gregor, John A.; and Sellers, Gregory J., 4,298,862, Cl. 340-572.000.

Semix Incorporated: *See*—
Lindmayer, Joseph, 4,298,423, Cl. 156-616.00R.

Semp, Bernard A.; Teng, Daniel M.; and Keritsis, Gus D., to Philip Morris, Inc. Method for recycling cellulosic waster materials from tobacco product manufacture. 4,298,013, Cl. 131-308.000.

Senco Products, Inc.: *See*—
Baker, Gordon P.; and Warman, Thomas E., 4,298,072, Cl. 173-13.000.

Seney, John S., to Du Pont de Nemours, E. I., and Company. Automatic cover for yarn bulking jet apparatus. 4,297,772, Cl. 28-257.000.

Sengupta, Asok: *See*—
Thankachan, Chacko; Ritchie, John G.; Sahayada, Eugene; and Sengupta, Asok, 4,298,658, Cl. 428-425.100.

Serrell, Peter V.: *See*—
Warnshuis, Paul L., Jr.; and Serrell, Peter V., 4,298,964, Cl. 367-4.000.

Sethofer, Nicholas L., to Timex Corporation. Cyclohexyl-dioxane liquid crystalline compounds. 4,298,528, Cl. 260-340.700.

Settzo, Robert J.: *See*—
Dorfeld, William G.; and Settzo, Robert J., 4,298,505, Cl. 252-513.000.

Seven W Enterprises, Inc.: *See*—
Weder, Donald E., 4,297,811, Cl. 47-72.000.

Severijns, Adrianus P.: *See*—
Staas, Frans A.; van Haeringen, Willem; and Severijns, Adrianus P., 4,297,856, Cl. 62-514.00R.

Severson, Larry A., to Branick Mfg., Inc. Locking device for curing rims. 4,298,420, Cl. 156-394.00R.

Seybold, R.: *See*—
Evertz, Egon; and Seybold, R., 4,298,180, Cl. 249-135.000.

Seymour, Samuel L., to PPG Industries, Inc. Delivering and aligning glass sheets in a bending station. 4,298,368, Cl. 65-25.200.

Seymour, Theodore J.: *See*—
Sakauye, Randall T.; Marlow, John V.; Laurie, Gordon H.; and Seymour, Theodore J., 4,297,866, Cl. 72-186.000.

Shabtai, Joseph: *See*—
Oblad, Alex G.; Shabtai, Joseph; and Ramakrishnan, Rasmasamy, 4,298,457, Cl. 208-107.000.

Shamp, Donald E.: *See*—
Stover, K. Lawrence; Bueno, Alejandro G.; Miller, James W.; and Shamp, Donald E., 4,298,372, Cl. 65-136.000.

Shannon, E. Paul. Rate of turn indicator. 4,297,883, Cl. 73-504.000.

Shapiro, Gerald N., to Analogic Corporation. Array Processor. 4,298,936, Cl. 364-200.000.

Sharp Kabushiki Kaisha: *See*—
Masuzawa, Sigeaki; Saiji, Mituhiro; and Tanimoto, Akira, 4,298,865, Cl. 340-706.000.

Shaver, Marvin B.; Vadas, Robert M.; and Stock, Norman A., to Dominion Engineering Works Limited. Drive system for grinding mills. 4,298,113, Cl. 192-0.094.

Shaw, Edward W. Sewing apparatus. 4,297,955, Cl. 112-121.150.

Shawhan, E. Neil; Vela, Octavio A.; and Smither, Miles A., to Sperry-Sun, Inc. Borehole acoustic telemetry system synchronous detector. 4,298,970, Cl. 367-82.000.

Shell Internationale Research Maatschappij B.V.: *See*—
Bischoff, Jurgen H.; and Sebulke, Joachim A., 4,298,840, Cl. 324-365.000.

Shell Oil Company: *See*—
Van Berkel, Johannes; and Kelderman, Hendrik C., 4,298,757, Cl. 560-231.000.
Verbrugge, Pieter A.; and Kramer, Petrus A., 4,298,756, Cl. 560-231.000.
Youn, Kun C.; and Wilpers, Dale J., 4,298,540, Cl. 260-412.400.

Shemitz, Sylvan R. Lighting system with baffle. 4,298,916, Cl. 362-127.000.

Sherlock, Hugh P.: *See*—
Irvin, Ronald D.; Runyan, Steven R.; and Sherlock, Hugh P., 4,298,976, Cl. 369-282.000.

Sherman, Charles J.: *See*—
Griffith, Gary L.; and Sherman, Charles J., 4,298,237, Cl. 339-17.00L.

Sherman, Donald R.: *See*—
Curchod, Donald B.; and Sherman, Donald R., 4,297,882, Cl. 73-460.000.

Shibata, Fujio: *See*—
Mikura, Chiho; and Shibata, Fujio, 4,298,631, Cl. 427-130.000.

Shichijo, Hajime; Yamamoto, Kenji; and Nakazawa, Kenichi, to Sony Corporation. Presettable tuning apparatus. 4,298,851, Cl. 334-11.000.

Shida, Mitsuzo: *See*—
Machonis, John, Jr.; Schmukler, Seymour; Zeitlin, Robert J.; and Shida, Mitsuzo, 4,298,712, Cl. 525-74.000.

Shigeta, Yoshihiro: *See*—
Kawamura, Masaharu; Shigeta, Yoshihiro; Uchidoi, Masanori; Sugiura, Yoji; and Yamamoto, Hiroshi, 4,298,256, Cl. 354-23.00D.

Shimada, Kiyohiro: *See*—
Mutai, Masahiko; Mada, Mitsuo; and Shimada, Kiyohiro, 4,298,619, Cl. 426-43.000.

Shimada, Toshiro: *See*—
Terada, Sachio; Suhara, Akito; Shimada, Toshiro; Nakamura, Takashi; Hujii, Kunizo; and Nakahira, Nobuichi, 4,298,424, Cl. 156-668.000.

Shimizu, Akira: *See*—
Tsuda, Hiroshi; Miyashita, Kiyoshi; Nishikawa, Masaji; Shimizu, Akira; and Kasuga, Muneo, 4,298,270, Cl. 355-3.0SH.

Shimizu, Kunitoshi; Takamura, Masakazu; and Iwasa, Toshio, to Asahi Kasei Kogyo Kabushiki Kaisha. Extremely fine acrylic polymer fiber pile fabric and process for producing the same. 4,298,644, Cl. 428-91.000.

Shimizu, Mituo. Synthetic strings. 4,297,835, Cl. 57-251.000.

Shimokawa, Yoshiyuki; and Tanimoto, Itaru, to Tokyo Shibaura Denki Kabushiki Kaisha. Data-processing device including means to suppress the execution of unnecessary instructions. 4,298,933, Cl. 364-200.000.

Shimp, Alan B.: *See*—
Maier, Alfred E.; Shimp, Alan B.; and Uram, David J., 4,298,852, Cl. 335-6.000.

Shimp, Richard L., to ComSonics, Inc. Split-band redundant amplifier system. 4,298,844, Cl. 330-124.00D.

Shinagawa Refractories Co., Ltd.: *See*—
Hayase, Masahiro; Sugimoto, Hiroyuki; and Takemoto, Mitsuteru, 4,298,391, Cl. 501-89.000.

Shindo, Minoru: *See*—
Oi, Nobuhiro; Aoki, Bunya; Shinozaki, Teizo; Moro, Kanji; Matsunaga, Isao; Noto, Takao; Nebashi, Toshiyuki; Harada, Yusuke; Endo, Hisao; Kimura, Takao; Okazaki, Hiroshi; Ogawa, Haruki; and Shindo, Minoru, 4,298,605, Cl. 424-246.000.

Shinoda, Masaichi: *See*—
Nozaki, Takao; Ito, Takashi; Arakawa, Hideki; Ishikawa, Hajime; and Shinoda, Masaichi, 4,298,629, Cl. 427-39.000.

Shinozaki, Fumiaki; Washigawa, Yasuo; Ikeda, Tomoaki; Nakao, Sho; and Kondoh, Syunichi, to Fuji Photo Film Co., Ltd. Light-sensitive composition. 4,298,679, Cl. 430-281.000.

Shinozaki, Nobuo: *See*—
Ogihara, Masuo; Chimura, Kozo; Shinozaki, Nobuo; and Seki, Yoichi, 4,298,972, Cl. 368-222.000.

Shinozaki, Teizo: *See*—
Oi, Nobuhiro; Aoki, Bunya; Shinozaki, Teizo; Moro, Kanji; Matsunaga, Isao; Noto, Takao; Nebashi, Toshiyuki; Harada, Yusuke; Endo, Hisao; Kimura, Takao; Okazaki, Hiroshi; Ogawa, Haruki; and Shindo, Minoru, 4,298,605, Cl. 424-246.000.

Shirahata, Kunikatsu: *See*—
Iida, Takao; Shirahata, Kunikatsu; Ishii, Shinzo; Okachi, Ryo; and Nara, Takashi, 4,298,690, Cl. 435-80.000.

Shitamori, Mamoru, to Kawasaki Jukogyo Kabushiki Kaisha. Lock for a stand of a two-wheeled vehicle. 4,298,211, Cl. 280-297.000.

Shoketsu Kinzoku Kogyo Kabushiki Kaisha: *See*—
Kukuminato, Tetsuo, 4,298,220, Cl. 285-178.000.

Sholette, William P.: *See*—
Joshi, Ashok V.; Jatkar, Arun D.; and Sholette, William P., 4,298,664, Cl. 429-191.000.

Shook, Frankie S.: *See*—
Bigelow, George A.; Rehage, Ted A.; and Shook, Frankie S., 4,298,954, Cl. 364-900.000.

Short, Wilbur G.: *See*—
Pearson, Eugene W.; and Short, Wilbur G., 4,297,870, Cl. 72-443.000.

Showa Denko K.K.: *See*—
Iwasaki, Hirokazu; and Takahashi, Hideo, 4,298,530, Cl. 260-343.30R.

Shy, Min C. Easily foldaway stand. 4,297,953, Cl. 108-131.000.

Siegel, Hardo: *See*—
Degner, Dieter; Siegel, Hardo; and Hannebaum, Heinz, 4,298,438, Cl. 204-78.000.

Siemenas-Albis AG: *See*—
Burianek, Rudolf; and Tschannen, Gottfried, 4,298,889, Cl. 358-148.000.

Siemens Aktiengesellschaft: *See*—
Aulich, Hubert; and Papp, Alfred, 4,298,245, Cl. 350-96.290.
Fischer, Rudolf, 4,298,934, Cl. 364-200.000.
Hok, Bertil, 4,297,890, Cl. 73-753.000.
Koslar, Manfred, 4,298,837, Cl. 324-72.500.
Quella, Ferdinand; and Pape, Heinz, 4,298,802, Cl. 250-484.000.

Siemens Gammasonics, Inc.: *See*—
Stoub, Everett W.; Colsher, James G.; and Muehllehner, Gerd, 4,298,944, Cl. 364-515.000.
Signetics Corporation: *See*—
Salters, Roelof H. W.; and Koomen, Joannes J. M., 4,298,811, Cl. 307-296.00R.
Sikdar, Subhas K., to Occidental Research Corp. Recovery of hydrofluoric acid from fluosilicic acid. 4,298,586, Cl. 423-339.000.
Siller, Vinzenz. Apparatus for the continuous hardening of pump casings. 4,298,189, Cl. 266-123.000.
Sillers, Donald A., Jr., to Peerless Manufacturing Company. Multiple filter vessel. 4,298,474, Cl. 210-238.000.
Silver, Elizabeth J. Rocking toy. 4,298,196, Cl. 272-52.000.
Silverberg, Morton, to Xerox Corporation. Grooved vacuum belt document handling system. 4,298,277, Cl. 355-76.000.
Silvestri, George J., Jr., to Westinghouse Electric Corp. Method of optimizing the efficiency of a steam turbine power plant. 4,297,848, Cl. 60-660.000.
Simala, John J.: *See*—
Mendola, Charles F., 4,298,232, Cl. 299-64.000.
Sime, Stuart J.: *See*—
Parslow, Michael W.; and Sime, Stuart J., 4,298,494, Cl. 252-174.160.
Sims, Anson: *See*—
Jones, Lawrence T.; Sims, Anson; Howden, Ashley G.; Knighton, Mark S.; and Kingsbury, LC James, 4,298,788, Cl. 219-386.000.
Sindermann, Siegmar: *See*—
Knabe, Uwe; Sindermann, Siegmar; and Jordan, Heinrich, 4,298,039, Cl. 141-90.000.
Singer Company, The: *See*—
Acker, Robert H.; Wessling, William C.; Brand, Arnold J.; and Naydan, Bob N., 4,298,832, Cl. 318-318.000.
Adams, Kenneth D., 4,297,958, Cl. 112-220.000.
Hoeffken, Russell W., 4,298,061, Cl. 165-170.000.
Ketterer, Stanley J., 4,297,957, Cl. 112-184.000.
Singer, Gilbert L. Board game using movable transparent overlay. 4,298,202, Cl. 273-247.000.
Singh, Laxman; and Rice, Wayne K., to Vitamins, Inc. Method for producing wheat germ lipid products. 4,298,622, Cl. 426-254.000.
Sittig, Roland, to BBC, Brown, Boveri & Co., Ltd. Power thyristor and method of fabrication therefore utilizing control, generating, and firing gates. 4,298,880, Cl. 357-38.000.
Sjoholm, Johan E. P.: *See*—
Kihlberg, Yngve R.; and Sjoholm, Johan E. P., 4,298,057, Cl. 165-159.000.
Skelton, John: *See*—
Davis, Robert B.; Skelton, John; Clark, Richard E.; and Swanson, Wilbur M., 4,297,749, Cl. 3-1.500.
Skibinski, Orland E.: *See*—
Bullock, Ralph; and Skibinski, Orland E., 4,297,817, Cl. 52-169.600.
Skov, Allan, to Haldor Topsoe A/S. Process and a plant for preparing a gas rich in methane. 4,298,694, Cl. 518-704.000.
Slabik, Angela: *See*—
Becker, Manfred; Slabik, Angela; Mucke, Bruno; Moisar, Erik; and von Rintelen, Harald, 4,298,683, Cl. 430-569.000.
Slater, David H.: *See*—
Munday, George; Slater, David H.; Tyley, Leonard R. T.; Berenblut, Brian J.; and Whitehouse, Harry B., 4,298,955, Cl. 364-900.000.
Sletten, Carlyle J., to Solar Energy Technology, Inc. Offset-fed multibeam tracking antenna system utilizing especially shaped reflector surfaces. 4,298,877, Cl. 343-781.0CA.
Smathers, Robert E.: *See*—
Bush, Steven C.; and Smathers, Robert E., 4,298,199, Cl. 273-1.0GD.
Smith, Addison M.: *See*—
Cochran, Jerry R.; Insinger, Thomas H.; Hollenbach, Gerald E.; Piskorz, Ronald F.; and Smith, Addison M., 4,298,765, Cl. 568-754.000.
Smith International, Inc.: *See*—
Emery, Maurice M., 4,298,077, Cl. 175-65.000.
Smith, John W.: *See*—
Edwards, John W.; and Smith, John W., 4,298,833, Cl. 318-561.000.
McCarter, Louis N., III; Deemer, W. Robert; Meeker, Robert G.; Weaver, Harry B.; and Smith, John W., 4,298,287, Cl. 366-4.000.
Smith, Michael R.: *See*—
DiFulvio, Anthony P.; and Smith, Michael R., 4,298,571, Cl. 422-65.000.
Smith, Robert D.: *See*—
Rolstad, Erik; Korpas, Thor-Harrald; Leyse, Robert H.; and Smith, Robert D., 4,298,430, Cl. 376-247.000.
Smith, William, to Steel Company of Canada, Ltd., The. Metal strip downcoilers. 4,297,865, Cl. 72-146.000.
Smith, Winthrop W., Jr., to Westinghouse Electric Corp. Multipoint pipeline processor for computing the discrete fourier transform. 4,298,950, Cl. 364-726.000.
Smither, Miles A.: *See*—
Shawhan, E. Neil; Vela, Octavio A.; and Smither, Miles A., 4,298,970, Cl. 367-82.000.
Smolin, Jury I.: *See*—
Batalin, Oleg E.; Dykman, Arkady S.; Osadchenko, Alexandr I.; Balkhanova, Galina F.; Belgorodsky, Izrail M.; Nevstruev, Vladimir I.; Radionov, Valery A.; Tulchinsky, Eduard A.; Belyaev, Valentin M.; Smolin, Jury I.; Breiman, Mark I.; Orlyansky, Vitaly V.; Zhirnov, Nikolai Y.; Galibin, Nikolai V.; Troitsky, Adrian P.; and Kovalenko, Vladimir V., 4,298,503, Cl. 252-432.000.
Snamprogetti S.p.A.: *See*—
Lagana', Vincenzo; and Pasero, Riccardo, 4,298,041, Cl. 141-392.000.
Snary, David, to Burroughs Wellcome Co. *Trypanosoma cruzi* glycoprotein vaccine for inducing immunity to Chagas' disease. 4,298,596, Cl. 424-88.000.
Snavely, Benjamin H., to Sperry Corporation. Shear bar for forage harvesters or the like. 4,298,170, Cl. 241-222.000.
Snitzer, Elias; and Meltz, Gerald, to United Technologies Corporation. Fiber optic hot spot detector. 4,298,794, Cl. 250-227.000.
Snow Brand Milk Products Co., Ltd.: *See*—
Saiki, Yukihiro; Kumazawa, Eitaro; and Ishioka, Yozo, 4,297,793, Cl. 34-56.000.
Sobolewski, Roman: *See*—
Bielska-Lewandowska, Halina; Irisova, Natalija; Jung, Grzegorz; Lewandowski, Stanislaw J.; Prohorov, Aleksandr; Sobolewski, Roman; and Vinogradov, Eugenij, 4,298,990, Cl. 455-325.000.
Societa' Pneumatici Pirelli: *See*—
Gallizia, Achille, 4,298,321, Cl. 425-120.000.
Societe Anonyme SICMA - Societe Industrielle: *See*—
Marechal, Robert, 4,297,912, Cl. 74-501.00R.
Societe Chimique des Charbonnages-CdF Chimie: *See*—
Machon, Jean-Pierre, 4,298,717, Cl. 526-124.000.
Societe Nationale d'etude et de Construction de Moteurs d'Aviation: *See*—
Halin, Yves R.; and LeLandais, Jacques R. A., 4,297,844, Cl. 60-226.00A.
Societe Nationale Industrielle Aerospatiale: *See*—
Euler, August H. L.; and Beziac, Gilbert F. A., 4,298,417, Cl. 156-228.000.
Sodickson, Lester A.; and Lim, Franklin, to Damon Corporation. Method and apparatus for chemical spot test analysis. 4,298,345, Cl. 23-230.00R.
Soerensen, Kai O.: *See*—
Krogsrud, Jens C.; and Soerensen, Kai O., 4,298,921, Cl. 362-346.000.
Soffge, Friedhelm; and Weigele, Hans, to Dr. Ing. h.c.F. Porsche AG. Floating bridge. 4,297,759, Cl. 14-2.600.
Sohne, Jakob Pressl: *See*—
Pressl, Klaus A., 4,298,144, Cl. 222-256.000.
Solar Energy Technology, Inc.: *See*—
Sletten, Carlyle J., 4,298,877, Cl. 343-781.0CA.
Soldat, Robert W.: *See*—
Richardson, John G.; and Soldat, Robert W., 4,298,163, Cl. 236-46.00R.
Solf, Bernhard: *See*—
Makosch, Geunter; and Solf, Bernhard, 4,298,283, Cl. 356-351.000.
Solovieff, Paul G. Lock mechanism with removable cylinder holder. 4,297,862, Cl. 70-129.000.
Someno, Noboru; Komatsubara, Michimasa; and Toyoshima, Masakatsu, to Sony Corporation. Tuning apparatus. 4,298,989, Cl. 455-183.000.
Somet Societa Meccanica Tessile S.p.A.: *See*—
Viscardi, Ettore, 4,298,034, Cl. 139-453.000.
Sommer, Gerd R.: *See*—
Sterki, Armin; and Sommer, Gerd R., 4,297,788, Cl. 33-179.50R.
Sommerfeld, Eugene G.; and Noyes, Paul R., to Du Pont de Nemours, E. I., and Company. Branched polyesters for adhesives and coating compositions. 4,298,724, Cl. 528-302.000.
Son, Pyong-Nae: *See*—
Lai, John T.; and Son, Pyong-Nae, 4,298,737, Cl. 544-360.000.
Sondermann, Siegfried. Motor vehicle ignition-starter switch. 4,298,776, Cl. 200-11.00C.
Sonerud, John T., to Soneruds Maskin Aktiebolag. Apparatus for digging post holes and erecting posts. 4,297,799, Cl. 37-2.00R.
Soneruds Maskin Aktiebolag: *See*—
Sonerud, John T., 4,297,799, Cl. 37-2.00R.
Sony Corporation: *See*—
Okada, Takashi, 4,298,885, Cl. 358-39.000.
Shichijo, Hajime; Yamamoto, Kenji; and Nakazawa, Kenichi, 4,298,851, Cl. 334-11.000.
Someno, Noboru; Komatsubara, Michimasa; and Toyoshima, Masakatsu, 4,298,989, Cl. 455-183.000.
Soodak, Charles: *See*—
Wang, Cheng L.; Soodak, Charles; and Lohr, David, 4,298,938, Cl. 364-413.000.
Soulier, Joel, to Isobox-Barbier. Apparatus for molding particulate expandable thermoplastic resin material using microwave heating. 4,298,324, Cl. 425-174.80E.
Spahrkas, Heinrich: *See*—
Knopf, Herbert; Spahrkas, Heinrich; and Luck, Wolfhard, 4,298,344, Cl. 8-94.260.
Specht, Steven J.; and Kircher, Morton S., to Olin Corporation. Automatic tightener/loosener for intercell electrical connectors. 4,297,923, Cl. 81-57.410.
Spence, Adam M.; and Goff, James R. Apparatus for use in underground long wall mine workings. 4,298,231, Cl. 299-50.000.
Spence, James R., to Standard Oil Company (Indiana). Anti-static additives. 4,298,353, Cl. 44-71.000.
Sperry Corporation: *See*—
Snavely, Benjamin H., 4,298,170, Cl. 241-222.000.
Sperry-Sun, Inc.: *See*—
Shawhan, E. Neil; Vela, Octavio A.; and Smither, Miles A., 4,298,970, Cl. 367-82.000.

Spooner, James A.: *See—*
James, Robin H.; and Spooner, James A., 4,298,495, Cl. 252-643.000.

Spurgeon, John R. Electronic display apparatus. 4,298,868, Cl. 340-755.000.

Squirrell, Anton F., to Grovag Grossventiltechnik A.G. Bearing system for isolators. 4,298,235, Cl. 308-26.000.

Srivastava, Gopal K.: *See—*
Lai, Stephen; and Srivastava, Gopal K., 4,298,890, Cl. 358-158.000.

Staab, Heinz; and Ippen, Joachim, to Basf Aktiengesellschaft. Cyclically substituted fulvalenophanes. 4,298,751, Cl. 549-11.000.

Staas, Frans A.; van Haeringen, Willem; and Severijns, Adrianus P., to U.S. Philips Corporation. $^3$He-$^4$He Dilution refrigerator. 4,297,856, Cl. 62-514.00R.

Stabenow, Joachim: *See—*
Broecker, Franz J.; Baur, Karl G.; Platz, Rolf; and Stabenow, Joachim, 4,298,766, Cl. 568-862.000.

Stables, Harry C., to Glaxo Group Limited. Crystallization process. 4,298,732, Cl. 544-20.000.

Stables, Wilbur L.; Pendlebury, David; and Weiss, William R., to Allied Corporation. Interfloor tube aspirator inlet muffler. 4,298,153, Cl. 226-97.000.

Stahl, Karl-Heinz; Fend, Fritz; and Stahl, Werner, to Stahl, Karl-Heinz. Mist generator. 4,298,167, Cl. 239-129.000.

Stahl, Reinhard, to Volkswagenwerk AG. Force measuring hub. 4,297,877, Cl. 73-146.000.

Stahl, Werner: *See—*
Stahl, Karl-Heinz; Fend, Fritz; and Stahl, Werner, 4,298,167, Cl. 239-129.000.

Stallings, Billy G. Sewage septic system with liquid flow drainage control. 4,298,470, Cl. 210-170.000.

Standard Microsystems Corp.: *See—*
Richman, Paul, 4,298,769, Cl. 174-52.0FP.

Standard Oil Company: *See—*
Hardman, Harley F.; and Beach, Ronald I., 4,298,354, Cl. 44-56.000.

Standard Oil Company (Indiana): *See—*
Britch, James A., 4,298,218, Cl. 285-3.000.
Harper, Jon J.; and Pietsch, Stephen J., 4,298,580, Cl. 423-40.000.
Harper, Jon J.; and Pietsch, Stephen J., 4,298,759, Cl. 562-485.000.
Pellet, Regis J.; Gradassi, Michael J.; and Bertolacini, Ralph J., 4,298,461, Cl. 208-139.000.
Spence, James R., 4,298,353, Cl. 44-71.000.
Tatterson, David F.; and Ford, William D., 4,298,459, Cl. 208-120.000.

Stanley, Lorne R., to Safe-T Pacific Company. Article holder and dispenser including adjustable dispensing means and one-way discharge opening. 4,298,142, Cl. 221-304.000.

Starace, Jeremia P.: *See—*
Montalto, Anthony R.; Scerbo, Louis J.; and Starace, Jeremia P., 4,298,239, Cl. 339-66.00M.

State of Israel Ministry of Agriculture: *See—*
Alper, Yekutiel; Elkin, Itzhak; Wolf, Itzhak; Mihai, Gabriel; and Antler, Aharon, 4,297,832, Cl. 56-328.00R.

Stattel, Raymond J.; and Niswander, James K., to United States of America, Administrator, National Aeronautics and Space Administration. Memory-based frame synchronizer. 4,298,987, Cl. 375-106.000.

Staudinger, Gernot, to Voest-Alpine AG. Method for the gasification of coal. 4,298,355, Cl. 48-206.000.

Steeb, Jorg: *See—*
Claussen, Nils; and Steeb, Jorg, 4,298,385, Cl. 501-105.000.

Steel Company of Canada, Ltd., The: *See—*
Smith, William, 4,297,865, Cl. 72-146.000.

Steel Heddle Manufacturing Co.: *See—*
Kaufmann, Frank H.; and Kramer, Charles F., 4,298,032, Cl. 139-207.000.

Stella, Leo, to Torrington Company, The. Lube plug. 4,298,098, Cl. 184-105.00B.

Stempin, John L.; and Wexell, Dale R., to Corning Glass Works. Method for producing large metallic glass bodies. 4,298,382, Cl. 75-202.000.

Stempin, John L.: *See—*
Flannery, James E.; Stempin, John L.; and Wexell, Dale R., 4,298,390, Cl. 501-32.000.

Stephens, Leonard W., to Lane, Perry M. Ratchet wrench. 4,297,924, Cl. 81-59.100.

Sterki, Armin; and Sommer, Gerd R., to Maag- Zahnrader & Maschinen AG. Gear testing machine. 4,297,788, Cl. 33-179.50R.

Sterling Drug Inc.: *See—*
Lesher, George Y.; and Dickinson, William B., 4,298,609, Cl. 424-250.000.
Schmidt, Paul J.; and Hung, William M., 4,298,215, Cl. 282-27.500.

Stern, Richard M.: *See—*
Scherrer, Robert A.; and Stern, Richard M., 4,298,532, Cl. 260-346.220.

Stevens, Violete L.: *See—*
Ginter, Sally P.; Pawloski, Chester E.; and Stevens, Violete L., 4,298,709, Cl. 521-169.000.

Stievenart, Emile F.; and Deconinck, Hugo F., to AGFA-Gevaert N.V. Daylight reprographic camera. 4,298,272, Cl. 355-28.000.

Stirtz, Ronald H.; and Dellinger, Bill. Shoe with three-dimensionally transmitting shock-absorbing mechanism. 4,297,796, Cl. 36-28.000.

Stock, Norman A.: *See—*
Shaver, Marvin B.; Vadas, Robert M.; and Stock, Norman A., 4,298,113, Cl. 192-0.094.

Stocker, Charles T.: *See—*
Mehring, Jeffrey S.; Sayen, Ronald J.; Schara, Robert E.; Stocker, Charles T.; and Rodriguez, Juan G., 4,298,624, Cl. 426-532.000.

Stoltz, Woodrow W. Pipe carrying carts. 4,298,309, Cl. 414-745.000.

Storandt, Ralf, to Vereinigte Baubeschlagfabriken Gretsch & Co. GmbH. Ski safety binding of the diagonal release type. 4,298,213, Cl. 280-628.000.

Stoub, Everett W.; Colsher, James G.; and Muehllehner, Gerd, to Siemens Gammasonics, Inc. Distortion correction method and apparatus for scintillation cameras. 4,298,944, Cl. 364-515.000.

Stover, K. Lawrence; Bueno, Alejandro G.; Miller, James W.; and Shamp, Donald E., to Libbey-Owens-Ford Company. Combustion air flow control for regenerators. 4,298,372, Cl. 65-136.000.

Strand, Jerome E.: *See—*
Thill, Gary A.; and Strand, Jerome E., 4,298,000, Cl. 128-218.00A.

Strikis, Guntis V., to Ford Motor Company. Power steering pump. 4,298,316, Cl. 417-310.000.

Strong, Munro L. Collapsible sawhorse. 4,298,094, Cl. 182-155.000.

Stroup, John F.; Nypaver, Leonard P.; and Eberst, Dale S., to Van Dorn Company. Tonnage indicator for toggle press. 4,297,901, Cl. 73-862.530.

Stubenrauch, Gerd: *See—*
Hamprecht, Gerhard; Stubenrauch, Gerd; Urbach, Hans; and Wuerzer, Bruno, 4,298,731, Cl. 544-11.000.

Studt, William L.: *See—*
Condouris, George A.; Yelnosky, John; Riley, Richard L.; Won, Chong M.; Douglas, George H.; and Studt, William L., 4,298,608, Cl. 424-249.000.

Stuke, Josef: *See—*
Kassel, Karl-Heinz; Lutz, Manfred; Stuke, Josef; and Walsdorfer, Hubert, 4,298,671, Cl. 430-128.000.

Stull, Morton. Childproof, snap-on, twist-off safety cap and container. 4,298,129, Cl. 215-224.000.

Su, Tsung-Tsan: *See—*
Chang, Ching-Te; and Su, Tsung-Tsan, 4,298,603, Cl. 424-230.000.

Sugalski, Raymond K.; Hooke, John W.; and Pate, Paul E., to General Electric Company. Resealable vent valve for containers such as batteries. 4,298,662, Cl. 429-50.000.

Sugaya, Kiyoshi: *See—*
Konno, Kazuhiko; Goh, Atsushi; and Sugaya, Kiyoshi, 4,298,740, Cl. 546-226.000.

Sugaya, Yoshio: *See—*
Asawa, Tatsuro; Miyake, Haruhisa; Yamashita, Masami; and Sugaya, Yoshio, 4,298,699, Cl. 521-31.000.

Sugimoto, Hiroyuki: *See—*
Hayase, Masahiro; Sugimoto, Hiroyuki; and Takemoto, Mitsuteru, 4,298,391, Cl. 501-89.000.

Sugimoto, Kenji: *See—*
Ishizuka, Shinichi; and Sugimoto, Kenji, 4,297,925, Cl. 82-2.00R.

Sugiura, Muneharu; Minoura, Kazuo; and Minami, Setsuo, to Canon Kabushiki Kaisha. Scanning and projecting device. 4,298,271, Cl. 355-8.000.

Sugiura, Yoji: *See—*
Kawamura, Masaharu; Shigeta, Yoshihiro; Uchidoi, Masanori; Sugiura, Yoji; and Yamamoto, Hiroshi, 4,298,256, Cl. 354-23.00D.

Sugiyama, Masayoshi: *See—*
Sakurada, Shuroku; Nakashima, Yoichi; Kojima, Isao; Yagi, Hideyuki; Kariya, Tadaaki; and Sugiyama, Masayoshi, 4,298,881, Cl. 357-38.000.

Suhara, Akito: *See—*
Terada, Sachio; Suhara, Akito; Shimada, Toshiro; Nakamura, Takashi; Hujii, Kunizo; and Nakahira, Nobuichi, 4,298,424, Cl. 156-668.000.

Suladze, Otari N.: *See—*
Barbakadze, Dzhondo F.; Mindeli, Mamuka S.; Macharashvili, Petr G.; Rusidze, Vazha V.; and Suladze, Otari N., 4,298,192, Cl. 266-218.000.

Sullivan, Roger M., to O'Brien, Leo K.; and Carney, Thomas B. Aircraft collison avoidance system. 4,298,875, Cl. 343-112.0CA.

Sulzer Brothers Limited: *See—*
Schmitz, Gerd; and Hintsch, Otto, 4,298,107, Cl. 192-12.00D.

Sumitomo Chemical Company, Ltd.: *See—*
Sano, Takezo; Inoue, Tadanori; and Uemura, Yukikazu, 4,297,945, Cl. 101-395.000.

Sunbeam Plastics Corporation: *See—*
Montgomery, Gary V., 4,298,146, Cl. 222-536.000.

Sundermeyer, Frank D.; and Calcasola, Richard W., to United Technologies Corporation. Digital information transfer system (DITS) receiver. 4,298,959, Cl. 364-900.000.

Surgeonics Limited: *See—*
McKinley, Milton A., 4,298,165, Cl. 237-8.00R.

Susa, Ermanno: *See—*
Mayr, Adolfo; Galli, Paolo; Susa, Ermanno; Di Drusco, Giovanni; and Giachetti, Ettore, 4,298,718, Cl. 526-125.000.

Suss, Hans G.; and Kiml, Jiri, to Inventio AG. Switching apparatus for a group of elevators or the like. 4,298,100, Cl. 187-29.00R.

Sutton, Ernest S.: *See—*
Biddle, Richard A.; Vriesen, Calvin W.; and Sutton, Ernest S., 4,298,412, Cl. 149-19.500.

Suzuka, Teruo: *See—*
Fujimori, Kuniaki; Suzuka, Teruo; Inoue, Yukio; and Aizawa, Shirou, 4,298,460, Cl. 208-121.000.

Suzuki, Hiroyuki: *See—*
Takamura, Yoshio; Abe, Soichiro; Nakamura, Noboru; and Suzuki, Hiroyuki, 4,298,894, Cl. 358-229.000.

Suzuki, Isao: *See*—
Arai, Yoshio; Kataoka, Hiroyuki; Suzuki, Isao; and Yokota, Shozo, 4,298,895, Cl. 358-284.000.
Suzuki, Keizo; Okudaira, Sadayuki; Nishimatsu, Shigeru; and Kanomata, Ichiro, to Hitachi, Ltd. Dry etching apparatus. 4,298,419, Cl. 156-345.000.
Suzuki, Kuzuhiko; Fujiki, Yasuhiro; Kitahori, Tojiro; and Takada, Akira, to Kanzaki Paper Mfg. Co., Ltd. Method of producing medium-grade coated paper for rotogravure printing. 4,298,652, Cl. 428-323.000.
Suzuki, Yukio, to Tokyo Shibaura Denki Kabushiki Kaisha. Microwave heating apparatus with resistive heaters. 4,298,780, Cl. 219-10.55B.
Sved, Alan F.: *See*—
Fernstrom, John D.; and Sved, Alan F., 4,298,611, Cl. 424-261.000.
Swanson, Wilbur M.: *See*—
Davis, Robert B.; Skelton, John; Clark, Richard E.; and Swanson, Wilbur M., 4,297,749, Cl. 3-1.500.
Sweeney, Lawrence J., to Franklin Steel Company. Drive means for traffic delineator. 4,298,075, Cl. 173-129.000.
Sweeney, Lawrence J., to Franklin Steel Company. Traffic delineator. 4,298,292, Cl. 404-10.000.
Sweetheart Plastics, Inc.: *See*—
Davis, Paul, 4,298,133, Cl. 220-306.000.
Swengel, Robert C., Jr.; Fortuna, Jon A.; and Defibaugh, George R., to AMP Incorporated. Pre-insulated flag-type terminal. 4,298,243, Cl. 339-276.00F.
Swiss Aluminium Ltd.: *See*—
Dantzig, Jonathan A.; and Tyler, Derek E., 4,298,187, Cl. 266-217.000.
Switlik Parachute Company, Inc.: *See*—
Moran, Harold J., 4,297,758, Cl. 9-340.000.
Syldatk, Andreas: *See*—
Gerhardt, Werner; Wehle, Volker; Syldatk, Andreas; Rogall, Gabriele; Reiffert, Jurgen; and Conrad, Jens, 4,298,568, Cl. 422-16.000.
System Concepts, Inc.: *See*—
Craig, Philip V. C., 4,298,867, Cl. 340-728.000.
Szabo, Ferenc: *See*—
Nagy, Ferenc; Szabo, Ferenc; and Szucs, Zoltan F., 4,297,892, Cl. 73-826.000.
Szekely, Andrew G., to Union Carbide Corporation. Vortex reactor and method for adding solids to molten metal therewith. 4,298,377, Cl. 75-53.000.
Szucs, Zoltan F.: *See*—
Nagy, Ferenc; Szabo, Ferenc; and Szucs, Zoltan F., 4,297,892, Cl. 73-826.000.
Szymanski, Hans J.: *See*—
Dockner, Toni; Kempe, Uwe; Krug, Herbert; Magnussen, Peter; Praetorius, Werner; and Szymanski, Hans J., 4,298,748, Cl. 548-347.000.
Tachiuchi, Tsuguji; Hirahata, Shigeru; and Takezawa, Teruhiro, to Hitachi, Ltd. Character pattern display system. 4,298,931, Cl. 364-200.000.
Tadokoro, Tomio; and Horie, Tatsuro, to Hitachi, Ltd. Slipping detector system for vehicles. 4,298,940, Cl. 364-426.000.
Tagnon, Luc A., to Essilor International, "Cie Generale d'Optique". Method and apparatus for presenting test images at different distances from a subject. 4,298,253, Cl. 351-17.000.
Taiana, Peter: *See*—
Melton, Keith; Mercier, Olivier; and Taiana, Peter, 4,297,779, Cl. 29-446.000.
Tajima, Hatsuo; Hosono, Nagao; and Kanbe, Junichiro, to Canon Kabushiki Kaisha. Developing apparatus. 4,297,970, Cl. 118-652.000.
Takada, Akira: *See*—
Suzuki, Kuzuhiko; Fujiki, Yasuhiro; Kitahori, Tojiro; and Takada, Akira, 4,298,652, Cl. 428-323.000.
Takagi, Sadaaki. Method and apparatus for the manufacture of a locked material of filament. 4,298,418, Cl. 156-296.000.
Takagi, Yoshihiro; and Sakai, Masakado, to Fuji Photo Film Co., Ltd. Diffusion transfer photographic process. 4,298,677, Cl. 430-244.000.
Takahashi, Akira: *See*—
Kubo, Kazuhiko; Takahashi, Akira; and Oohashi, Kenichi, 4,298,386, Cl. 501-80.000.
Takahashi, Hideo: *See*—
Iwasaki, Hirokazu; and Takahashi, Hideo, 4,298,530, Cl. 260-343.30R.
Takahashi, Kazuo: *See*—
Morinaka, Yasuhiro; and Takahashi, Kazuo, 4,298,610, Cl. 424-256.000.
Takahashi, Kihei; Terada, Seiko; and Nakada, Kiyoshi, to Yoshida Kogyo, K.K. Weft tensioning device. 4,298,033, Cl. 139-450.000.
Takahashi, Masayuki: *See*—
Minagawa, Motonobu; Nakahara, Yutaka; and Takahashi, Masayuki, 4,298,520, Cl. 260-45.80R.
Takahashi, Saeko: *See*—
Amano, Shoichi; Miyadoh, Shinji; Takahashi, Saeko; Ezaki, Norio; Niwa, Tomizo; and Yamada, Yujiro, 4,298,599, Cl. 424-119.000.
Takahashi, Satoshi: *See*—
Komatsu, Shigeru; Takahashi, Satoshi; and Wakatsuki, Masao, 4,298,883, Cl. 357-72.000.
Takahashi, Shinkichi: *See*—
Marushima, Giichi; Tanaka, Hiroshi; Tosaka, Umi; Takahashi, Shinkichi; and Komiyu, Takao, 4,298,669, Cl. 430-55.000.
Takaki, Masaoki; Sawano, Hirokazu; Yamanaka, Kunio; Asada, Kazuyoshi; Hideshima, Keiji; and Koyanagi, Haruo, to Hitachi, Ltd.; and Nissan Motor Co., Ltd. Sequence control system. 4,298,958, Cl. 364-900.000.
Takamatsu, Takashi: *See*—
Tsuchiya, Shunji; and Takamatsu, Takashi, 4,298,318, Cl. 418-61.00B.
Takamura, Masakazu: *See*—
Shimizu, Kunitoshi; Takamura, Masakazu; and Iwasa, Toshio, 4,298,644, Cl. 428-91.000.
Takamura, Yoshio; Abe, Soichiro; Nakamura, Noboru; and Suzuki, Hiroyuki, to Tokyo Shibaura Denki Kabushiki Kaisha. Image pick-up tube. 4,298,894, Cl. 358-229.000.
Takanashi, Yukio; and Higuchi, Toshiharu, to Tokyo Shibaura Denki Kabushiki Kaisha. Directly heated type cathode assembly. 4,298,814, Cl. 313-302.000.
Takano, Yoshinori: *See*—
Tanizaki, Yoshiharu; Minagawa, Kenichiro; and Takano, Yoshinori, 4,298,488, Cl. 252-78.100.
Takase, Kunio, to Rohm and Haas Company. Crosslinked basic polymer and preparation thereof. 4,298,700, Cl. 521-32.000.
Takase, Tsutomu: *See*—
Yamazaki, Noboru; Takase, Tsutomu; Morimoto, Yoshio; and Yuasa, Teruo, 4,298,720, Cl. 526-262.000.
Takashima, Yasuyuki: *See*—
Kobayashi, Takuo; and Takashima, Yasuyuki, 4,298,117, Cl. 198-367.000.
Takasugi, Hisashi: *See*—
Ueda, Ikuo; Takaya, Takao; Kobayashi, Masakazu; Masugi, Takashi; Takasugi, Hisashi; Kochi, Hiromu; and Kitaguchi, Tadashi, 4,298,529, Cl. 260-340.90R.
Takaya, Takao: *See*—
Ueda, Ikuo; Takaya, Takao; Kobayashi, Masakazu; Masugi, Takashi; Takasugi, Hisashi; Kochi, Hiromu; and Kitaguchi, Tadashi, 4,298,529, Cl. 260-340.90R.
Takayama, Syuichi, to Olympus Optical Company Ltd. Apparatus for endoscopic photography. 4,298,260, Cl. 354-50.000.
Takeda Chemical Industries, Ltd.: *See*—
Higashide, Eiji; Tanida, Seiichi; Muroi, Masayuki; and Asai, Mitsuko, 4,298,600, Cl. 424-120.000.
Ito, Homu, 4,298,346, Cl. 23-230.00B.
Moriya, Koji; and Furuoya, Itsuo, 4,298,533, Cl. 260-346.750.
Natsugari, Hideaki; Mikami, Iwao; and Ochiai, Michihiko, 4,298,607, Cl. 424-246.000.
Ochiai, Michihiko; Okada, Taiiti; Aki, Osami; Morimoto, Akira; Kawakita, Kenji; and Matsushita, Yoshihiro, 4,298,606, Cl. 424-246.000.
Takemoto, Mitsuteru: *See*—
Hayase, Masahiro; Sugimoto, Hiroyuki; and Takemoto, Mitsuteru, 4,298,391, Cl. 501-89.000.
Takemura, Kazuo H.: *See*—
Dauben, William G.; Kessel, Carl R.; and Takemura, Kazuo H., 4,298,752, Cl. 549-42.000.
Takeshita, Toru: *See*—
Nishikawa, Osamu; Ishimaru, Kenji; Takeshita, Toru; and Tsuruta, Hideki, 4,298,537, Cl. 260-397.200.
Takeuchi, Eiichi: *See*—
Ohashi, Tetsro; Kitamura, Osamu; Fujii, Hiromu; Mineyuki, Seizo; and Takeuchi, Eiichi, 4,298,050, Cl. 164-468.000.
Takeuchi, Tsugio; Tsuge, Shin; Hirata, Yukio; and Mochizuki, Koichi, to Japan Spectroscopic Co. Ltd. Method and apparatus for introducing samples to a mass spectrometer. 4,298,795, Cl. 250-282.000.
Takezawa, Teruhiro: *See*—
Tachiuchi, Tsuguji; Hirahata, Shigeru; and Takezawa, Teruhiro, 4,298,931, Cl. 364-200.000.
Taki Industries Co., Ltd.: *See*—
Takigawa, Seiichi, 4,298,767, Cl. 13-25.000.
Takigawa, Seiichi, to Taki Industries Co., Ltd. Support for a heating element in an electric furnace. 4,298,767, Cl. 13-25.000.
Tallberg, Nils: *See*—
Olin, Henry; Tallberg, Nils; and Varis, Martti, 4,297,751, Cl. 4-431.000.
Talres Development (N.A.) N.V.: *See*—
Galleymore, Harry R.; James, Kenneth; Jones, Haydn F.; Bhardwaj, Chaman L.; Plant, James S., deceased; and Plant, Aline P., administrator, 4,298,730, Cl. 536-119.000.
Tamaru, Munetaka: *See*—
Watanabe, Minoru; Kume, Kazunari; Ohno, Hideshi; and Tamaru, Munetaka, 4,297,838, Cl. 368-76.000.
Tamori, Michitoshi: *See*—
Kawai, Kazuo; Yanagidaira, Hidetaka; and Tamori, Michitoshi, 4,298,983, Cl. 375-12.000.
Tamura, Hiroshi; and Nakaie, Yutaka, to Tokyo Shibaura Denki Kabushiki Kaisha. Intrabox temperature display device. 4,298,947, Cl. 364-557.000.
Tamura, Mitsuhiro; Ohishi, Tetsuo; and Sakurai, Hiroshi, to Nippon Zeon Co. Ltd. Diphenylamine derivatives and degradation inhibitors for rubber polymers. 4,298,522, Cl. 260-45.9QB.
Tamura, Takashi: *See*—
Katakura, Hiroshi; and Tamura, Takashi, 4,298,278, Cl. 355-85.000.
Tanaka, Etsuo; and Kato, Hirouobu, to Nippon Kogaku K.K. Light-intercepting device in a camera. 4,298,265, Cl. 354-246.000.
Tanaka, Hiroshi: *See*—
Marushima, Giichi; Tanaka, Hiroshi; Tosaka, Umi; Takahashi, Shinkichi; and Komiyu, Takao, 4,298,669, Cl. 430-55.000.
Tanaka, Keiji: *See*—
Sato, Tadashi; and Tanaka, Keiji, 4,298,268, Cl. 355-3.0SC.

Tanaka, Yoshihiro: *See—*
Matsuda, Motonobu; Matsui, Tohru; and Tanaka, Yoshihiro, 4,298,258, Cl. 354-25.000.

Tanida, Seiichi: *See—*
Higashide, Eiji; Tanida, Seiichi; Muroi, Masayuki; and Asai, Mitsuko, 4,298,600, Cl. 424-120.000.

Taniguchi, Kazuhiro: *See—*
Ando, Masato; Yamamoto, Kenji; and Taniguchi, Kazuhiro, 4,298,446, Cl. 204-224.00R.

Tanimoto, Akira: *See—*
Masuzawa, Sigeaki; Saiji, Mituhiro; and Tanimoto, Akira, 4,298,865, Cl. 340-706.000.

Tanimoto, Itaru: *See—*
Shimokawa, Yoshiyuki; and Tanimoto, Itaru, 4,298,933, Cl. 364-200.000.

Tanizaki, Yoshiharu; Minagawa, Kenichiro; and Takano, Yoshinori, to Nippon Oil and Fats Co., Ltd. Hydraulic fluid composition containing glycol ethers and borate ester. 4,298,488, Cl. 252-78.100.

Tannenbaum, Robin M.: *See—*
Gluck, Lewis; and Tannenbaum, Robin M., 4,298,920, Cl. 362-281.000.

Tao, Kak-Yuen: *See—*
Sartoretto, Paul; and Tao, Kak-Yuen, 4,298,512, Cl. 260-29.40R.

Tardivon, Marcel P.: *See—*
Dejob, Roger M.; and Tardivon, Marcel P., 4,298,963, Cl. 367-4.000.

Taskier, Henry T., to Celanese Corporation. Coated open-celled microporous membranes. 4,298,666, Cl. 429-206.000.

Tate & Lyle Limited: *See—*
Williams, Alan G.; Lawson, Christopher J.; and Wimpenny, Julian W. T., 4,298,725, Cl. 536-1.000.

Tatsuno, Kimio: *See—*
Tsunoda, Yoshito; Tatsuno, Kimio; Miyauchi, Toshimitsu; Aiki, Kunio; and Ito, Ryoichi, 4,298,974, Cl. 369-45.000.

Tatterson, David F.; and Ford, William D., to Standard Oil Company (Indiana). Fluid catalytic cracking of heavy petroleum fractions. 4,298,459, Cl. 208-120.000.

Taylor, Barry E., to Du Pont de Nemours, E. I., and Company. Flux treated solder powder composition. 4,298,407, Cl. 148-24.000.

Taylor, Lloyd D., to Polaroid Corporation. Novel polymeric mordants for photographic dyes. 4,298,675, Cl. 430-213.000.

Taylor, Lloyd D.: *See—*
Barton, Derek H. R.; Bronstein-Bonte, Irena Y.; and Taylor, Lloyd D., 4,298,676, Cl. 430-221.000.

Taylor, Lynn J.; and Grier, John D., to Owens-Illinois, Inc. Composition of matter. 4,298,516, Cl. 260-31.80R.

TDK Electronics Co., Ltd.: *See—*
Mikura, Chiho; and Shibata, Fujio, 4,298,631, Cl. 427-130.000.

Teare, John W. Method and apparatus for producing concrete panels. 4,298,413, Cl. 156-42.000.

Technicare Corporation: *See—*
Mezrich, Reuben S.; Vilkomerson, David H. R.; and Gardineer, Bayard, 4,298,009, Cl. 128-660.000.

Technutra, S.A.: *See—*
Howard, Alan N., 4,298,601, Cl. 424-128.000.

Tecnomare S.p.A.: *See—*
Bozzo, Gian M.; Gava, Paolo; and Paruzzolo, Antonio, 4,298,295, Cl. 405-52.000.

Teijin Limited: *See—*
Nishikawa, Osamu; Ishimaru, Kenji; Takeshita, Toru; and Tsuruta, Hideki, 4,298,537, Cl. 260-397.200.

Tell, Benjamin: *See—*
Boyd, Gary D.; Mohapatra, Sarat K.; Tell, Benjamin; Wagner, Sigurd; and Wudl, Fred, 4,298,250, Cl. 350-357.000.

Tellerman, Jacob, to Temposonics, Incorporated. Integrated ultrasonic magnetic encoder. 4,298,861, Cl. 340-365.00L.

Tellus Machinery Corporation: *See—*
Hainline, Truman D., 4,297,940, Cl. 98-33.00R.

Temple, Davis L., Jr., to Mead Johnson & Company. Diazaheterocyclopurines and triazolopyrimidines. 4,298,734, Cl. 544-251.000.

Temple, Lowell D. Method for connecting sewer pipes to manholes or other pipes. 4,297,780, Cl. 29-451.000.

Temposonics, Incorporated: *See—*
Tellerman, Jacob, 4,298,861, Cl. 340-365.00L.

Teng, Daniel M.: *See—*
Semp, Bernard A.; Teng, Daniel M.; and Keritsis, Gus D., 4,298,013, Cl. 131-308.000.

Tenneco Chemicals, Inc.: *See—*
Clarke, David B., 4,298,481, Cl. 252-21.000.

Terada, Sachio; Suhara, Akito; Shimada, Toshiro; Nakamura, Takashi; Hujii, Kunizo; and Nakahira, Nobuichi, to VBE Industries, Ltd. Method for etching polyamide shaped articles. 4,298,424, Cl. 156-668.000.

Terada, Seiko: *See—*
Takahashi, Kihei; Terada, Seiko; and Nakada, Kiyoshi, 4,298,033, Cl. 139-450.000.

Terashima, Masahiko: *See—*
Nagata, Toshiyuki; Terashima, Masahiko; and Mashima, Kazuto, 4,298,628, Cl. 426-656.000.

Terouanne, Beatrice: *See—*
Nicolas, Jean C.; Terouanne, Beatrice; Descomps, Bernard; and De Paulet, Andre C., 4,298,686, Cl. 435-7.000.

Tershak, Andrew T.: *See—*
Paddock, Stephen W.; and Tershak, Andrew T., 4,297,851, Cl. 62-126.000.

Teschner, Eckart; Sattelmeyer, Richard; and Hesse, Wolfgang, to Hoechst Aktiengesellschaft. Process for the manufacture of abrasives. 4,298,356, Cl. 51-297.000.

Texaco Development Corporation: *See—*
Hunter, Walter D., 4,298,479, Cl. 252-8.55D.
Schulze, Heinz; Zimmerman, Robert L.; and Naylor, Carter G., 4,298,708, Cl. 521-115.000.

Texaco Inc.: *See—*
Dorawala, Tansukhlal G.; and Kerr, Edwin R., 4,298,452, Cl. 208-8.0LE.
Huang, Wann-Sheng, 4,298,455, Cl. 208-48.0AA.

Texas Instruments Incorporated: *See—*
Hartsell, Glenn A.; and Bilek, F. Thomas, 4,298,946, Cl. 364-557.000.
Poland, Sydney W., 4,298,949, Cl. 364-706.000.

Textron Inc.: *See—*
Earl, T. Desmond, 4,298,175, Cl. 244-13.000.

Thankachan, Chacko; Ritchie, John G.; Sahayada, Eugene; and Sengupta, Asok, to J.G.L. Chemicals Ltd. Vapor permeation curable coatings based on alkyd resins. 4,298,658, Cl. 428-425.100.

Thayer, Paul G., to Westinghouse Electric Corp. Hermetic compressor having a valve to drain liquid accumulations from its cylinder head. 4,298,314, Cl. 417-299.000.

Theeuwes, Felix; and Cortese, Richard, to ALZA Corporation. System for delivering agent at zero order rate with emerging agent below saturation. 4,298,003, Cl. 128-260.000.

Theophile, Christ: *See—*
Pellerin, Andrew P.; and Theophile, Christ, 4,298,850, Cl. 333-257.000.

Thermo Electron Corporation: *See—*
Huffman, Fred N., 4,298,798, Cl. 250-423.00R.

Thermonetics, Inc.: *See—*
Samis, James M.; Waechter, Walter C.; and James, Ronald D., 4,298,621, Cl. 426-55.000.

Thill, Gary A.; and Strand, Jerome E., to Minnesota Mining and Manufacturing Company. Fluid dispensing device. 4,298,000, Cl. 128-218.00A.

Thiokol Corporation: *See—*
Biddle, Richard A.; Vriesen, Calvin W.; and Sutton, Ernest S., 4,298,412, Cl. 149-19.500.

Thomas Broadbent & Sons Limited: *See—*
Jackson, Joseph F., 4,298,160, Cl. 233-7.000.

Thomas C. Elder, Inc.: *See—*
Kaufman, Kurt D., 4,298,614, Cl. 424-279.000.

Thomas, Charles E.: *See—*
Eichelberger, Charles W.; Thomas, Charles E.; and Wojnarowski, Robert J., 4,298,789, Cl. 219-406.000.

Thomas, Lowell E., to Dynamics Research Corporation. Method of forming insulated conductors in a conductive medium and article thus formed. 4,298,436, Cl. 204-15.000.

Thompson, David A.: *See—*
Johnson, Lauren K.; and Thompson, David A., 4,298,389, Cl. 501-77.000.

Thomson-CSF: *See—*
Crochet, Pierre, 4,298,876, Cl. 343-756.000.
Dupressoir, Albert; and Salvat, Francois, 4,298,878, Cl. 343-795.000.

Thorn Svenska A.B.: *See—*
Adolfsson, Rune F. R.; and Gellert, Dietrich W., 4,298,551, Cl. 261-121.00R.

Thyret, Helmut; Balwe, Thomas; Hanzalik, Josef; Furst, Herbert; and Bauer, Johann, to Wacker-Chemie GmbH. Polymerization autoclave. 4,298,576, Cl. 422-135.000.

Times Fiber Communications, Inc.: *See—*
Dabby, Franklin W.; and Chesler, Ronald B., 4,298,366, Cl. 65-3.120.

Timex Corporation: *See—*
Sethofer, Nicholas L., 4,298,528, Cl. 260-340.700.

Tkalenko, Victor J., Jr.: *See—*
McElligott, Michael J.; and Tkalenko, Victor J., Jr., 4,298,216, Cl. 203-6.000.

Toda, Munetaka: *See—*
Masaki, Masaru; Ito, Yoshinori; Inoue, Akihiko; and Toda, Munetaka, 4,297,867, Cl. 72-347.000.

Togo, Shoichi; and Miyashita, Takeshi, to Canon Kabushiki Kaisha. Display device for camera. 4,298,257, Cl. 354-23.00D.

Tokyo Keiki Company Limited: *See—*
Tsuchiya, Shunji; and Takamatsu, Takashi, 4,298,318, Cl. 418-61.00B.

Tokyo Kogaku Kikai Kabushiki Kaisha: *See—*
Karasawa, Yukinori, 4,298,919, Cl. 362-226.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Nakajima, Koichiro; and Watanabe, Masaharu, 4,298,410, Cl. 148-172.000.
Nei, Hiromichi; Ohtani, Ryoichi; Ohshima, Iwao; and Horikawa, Yuji, 4,297,873, Cl. 73-61.0LM.
Shimokawa, Yoshiyuki; and Tanimoto, Itaru, 4,298,933, Cl. 364-200.000.
Suzuki, Yukio, 4,298,780, Cl. 219-10.55B.
Takamura, Yoshio; Abe, Soichiro; Nakamura, Noboru; and Suzuki, Hiroyuki, 4,298,894, Cl. 358-229.000.
Takanashi, Yukio; and Higuchi, Toshiharu, 4,298,814, Cl. 313-302.000.
Tamura, Hiroshi; and Nakaie, Yutaka, 4,298,947, Cl. 364-557.000.
Yoshimaru, Tomohisa; Sato, Yasuhiro; and Yamashita, Mitsuo, 4,298,269, Cl. 355-3.00R.

Tokyo Shibaura Electric Co., Ltd.: *See*—
Komatsu, Shigeru; Takahashi, Satoshi; and Wakatsuki, Masao, 4,298,883, Cl. 357-72.000.
Toma, John W., to General Electric Company. Two-speed clutch with neutral. 4,298,110, Cl. 192-48.400.
Tomassetti, Jerome, Jr.; and Lerch, Adolph F. Dome structure. 4,297,814, Cl. 52-81.000.
Tominaga, Hideo, to Fontaine Industries, Inc. Lens-free sighting device. 4,297,789, Cl. 33-298.000.
Tomiyama, Raiji: *See*—
Kogo, Hiroshi; Tonooka, Mamoru; Aoki, Teruhisa; Ando, Shigeo; and Tomiyama, Raiji, 4,298,965, Cl. 367-13.000.
Tompson, Clement R.; and Gruner, Garrett. Heating system. 4,298,943, Cl. 364-505.000.
Tonnessen, Arne, to Moss Rosenberg Verft A.S. Tank with a dome onboard ships. 4,297,960, Cl. 114-74.00A.
Tonooka, Mamoru: *See*—
Kogo, Hiroshi; Tonooka, Mamoru; Aoki, Teruhisa; Ando, Shigeo; and Tomiyama, Raiji, 4,298,965, Cl. 367-13.000.
Torigai, Akiyoshi, to Canon Kabushiki Kaisha. Magnetic powder transporting device. 4,297,969, Cl. 118-652.000.
Torregrossa, Louis O.; Bentvelzen, Jozef M.; Crosby, Gerald D.; Meredith, Michael D.; and Bepple, Henry, to Weyerhaeuser Company. Method and apparatus for treating pulp with oxygen in a multi-stage bleaching sequence. 4,298,426, Cl. 162-57.000.
Torregrossa, Louis O.: *See*—
Bentvelzen, Jozef M.; Meredith, Michael D.; Torregrossa, Louis O.; and Bepple, Henry, 4,298,427, Cl. 162-57.000.
Torrington Company, The: *See*—
Stella, Leo, 4,298,098, Cl. 184-105.00B.
Tosaka, Umi: *See*—
Marushima, Giichi; Tanaka, Hiroshi; Tosaka, Umi; Takahashi, Shinkichi; and Komiyu, Takao, 4,298,669, Cl. 430-55.000.
Tournier, Claude. Method and installation for processing bovine feet. 4,297,764, Cl. 17-46.000.
Toyo Boseki Kabushiki Kaisha: *See*—
Miyagawa, Yoshiaki; and Mitomi, Takeshi, 4,298,643, Cl. 428-85.000.
Toyo Kogyo Co., Ltd.: *See*—
Mizuma, Takashi, 4,298,226, Cl. 296-216.000.
Toyo Seikan Kaisha, Ltd.: *See*—
Ohmi, Hidehiko; and Ishibashi, Kazuhisa, 4,298,320, Cl. 425-110.000.
Toyoda-Koki Kabushiki-Kaisha: *See*—
Etoh, Kunihiko; Ishigaki, Tamotsu; and Niwa, Kuniyuki, 4,298,928, Cl. 364-200.000.
Toyoshima, Masakatsu: *See*—
Someno, Noboru; Komatsubara, Michimasa; and Toyoshima, Masakatsu, 4,298,989, Cl. 455-183.000.
Toyota, Akinori: *See*—
Morita, Yoshinori; Toyota, Akinori; and Kashiwa, Norio, 4,298,713, Cl. 525-323.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Inada, Masami; Kitamura, Kazuhiko; Ito, Shoji; Nonoyama, Takao; and Tsuji, Riichi, 4,298,020, Cl. 137-315.000.
Masaki, Masaru; Ito, Yoshinori; Inoue, Akihiko; and Toda, Munetaka, 4,297,867, Cl. 72-347.000.
Trane Company, The: *See*—
Butt, Alan G.; and Whitehead, Abe G., 4,297,775, Cl. 29-157.30R.
Traxler, Peter: *See*—
Schupp, Thomas; Traxler, Peter; and Nuesch, Jakob, 4,298,692, Cl. 435-119.000.
Treton, Jean-Pierre: *See*—
Michelet, Guy; and Treton, Jean-Pierre, 4,298,247, Cl. 350-295.000.
Trimborn, Werner: *See*—
Lechtken, Peter; Buethe, Ingolf; Jacobi, Manfred; and Trimborn, Werner, 4,298,738, Cl. 546-22.000.
Troitsky, Adrian P.: *See*—
Batalin, Oleg E.; Dykman, Arkady S.; Osadchenko, Alexandr I.; Balkhanova, Galina F.; Belgorodsky, Izrail M.; Nevstruev, Vladimir I.; Radionov, Valery A.; Tulchinsky, Eduard A.; Belyaev, Valentin M.; Smolin, Jury I.; Breiman, Mark I.; Orlyansky, Vitaly V.; Zhirnov, Nikolai Y.; Galibin, Nikolai V.; Troitsky, Adrian P.; and Kovalenko, Vladimir V., 4,298,503, Cl. 252-432.000.
Trutzschler GmbH & Co. KG: *See*—
Leifeld, Ferdinand, 4,297,767, Cl. 19-80.00R.
Trutzschler, Hermann, 4,297,766, Cl. 19-80.00R.
Trutzschler, Hermann, to Trutzschler GmbH & Co. KG. Method and apparatus for forming fiber mixtures. 4,297,766, Cl. 19-80.00R.
TRW Inc.: *See*—
McKee, William H., 4,298,242, Cl. 339-258.00R.
Tschannen, Gottfried: *See*—
Burianek, Rudolf; and Tschannen, Gottfried, 4,298,889, Cl. 358-148.000.
Tsuchimoto, Takamitsu: *See*—
Nishihara, Mikio; Oda, Masahiro; and Tsuchimoto, Takamitsu, 4,298,770, Cl. 174-68.500.
Tsuchiya, Shunji; and Takamatsu, Takashi, to Tokyo Keiki Company Limited. Rotary valve for fluid motor or pump. 4,298,318, Cl. 418-61.00B.
Tsuchiya, Tsutomu: *See*—
Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Tsutomu; Jikahara, Tomo; and Miyake, Toshiaki, 4,298,727, Cl. 536-10.000.
Tsuda, Hiroshi; Miyashita, Kiyoshi; Nishikawa, Masaji; Shimizu, Akira; and Kasuga, Muneo, to Olympus Optical Company Limited. Electrographic apparatus. 4,298,270, Cl. 355-3.0SH.
Tsuda, Hiroshi; Miyashita, Kiyoshi; Kimura, Katsuhiko; Arima, Heihachi; and Ishimoto, Osamu, to Olympus Optical Company Limited. Feeding apparatus cassette type roll sheet. 4,298,276, Cl. 355-72.000.
Tsuge, Shin: *See*—
Takeuchi, Tsugio; Tsuge, Shin; Hirata, Yukio; and Mochizuki, Koichi, 4,298,795, Cl. 250-282.000.
Tsuji, Riichi: *See*—
Inada, Masami; Kitamura, Kazuhiko; Ito, Shoji; Nonoyama, Takao; and Tsuji, Riichi, 4,298,020, Cl. 137-315.000.
Tsunoda, Yoshito; Tatsuno, Kimio; Miyauchi, Toshimitsu; Aiki, Kunio; and Ito, Ryoichi, to Hitachi, Ltd. Optical head for a videodisc player/recorder. 4,298,974, Cl. 369-45.000.
Tsuruta, Hideki: *See*—
Nishikawa, Osamu; Ishimaru, Kenji; Takeshita, Toru; and Tsuruta, Hideki, 4,298,537, Cl. 260-397.200.
Tuggle, Lloyd H., to Beaird-Poulan Division. Chain saw nose guard. 4,297,786, Cl. 30-382.000.
Tulchinsky, Eduard A.: *See*—
Batalin, Oleg E.; Dykman, Arkady S.; Osadchenko, Alexandr I.; Balkhanova, Galina F.; Belgorodsky, Izrail M.; Nevstruev, Vladimir I.; Radionov, Valery A.; Tulchinsky, Eduard A.; Belyaev, Valentin M.; Smolin, Jury I.; Breiman, Mark I.; Orlyansky, Vitaly V.; Zhirnov, Nikolai Y.; Galibin, Nikolai V.; Troitsky, Adrian P.; and Kovalenko, Vladimir V., 4,298,503, Cl. 252-432.000.
Tullock, Charles W.: *See*—
Coliette, John W.; and Tullock, Charles W., 4,298,722, Cl. 526-348.600.
Turnbull, John, to Celanese Corporation. Belting fabric. 4,298,648, Cl. 428-195.000.
Tutty, Geoffrey C., to INCA Limited. Image wise developable sheet. 4,298,651, Cl. 428-307.000.
Tyler, Derek E.: *See*—
Dantzig, Jonathan A.; and Tyler, Derek E., 4,298,187, Cl. 266-217.000.
Tyley, Leonard R. T.: *See*—
Munday, George; Slater, David H.; Tyley, Leonard R. T.; Berenblut, Brian J.; and Whitehouse, Harry B., 4,298,955, Cl. 364-900.000.
Tzikas, Athanassios, to Ciba-Geigy Ag. Process for the manufacture of 1,2-diaminoanthraquinone. 4,298,536, Cl. 260-378.000.
Uchida, Mitsuo; Oguri, Yasuo; Saito, Junji; and Kawahara, Tsukasa, to Mitsubishi Chemical Industries, Ltd. Process for preparing calcium silicate shaped product. 4,298,561, Cl. 264-86.000.
Uchida, Ryohei: *See*—
Akamatsu, Masahiko; and Uchida, Ryohei, 4,298,838, Cl. 324-117.00R.
Uchida, Takaaki: *See*—
Doi, Yoshikazu; Uchida, Takaaki; and Sakai, Yutaka, 4,298,252, Cl. 350-470.000.
Uchidoi, Masanori: *See*—
Kawamura, Masaharu; Shigeta, Yoshihiro; Uchidoi, Masanori; Sugiura, Yoji; and Yamamoto, Hiroshi, 4,298,256, Cl. 354-23.00D.
Uchiyama, Yoshihiro: *See*—
Sato, Isao; Kato, Fumio; Uchiyama, Yoshihiro; Iizuka, Nobuyuki; and Hata, Tsuneyuki, 4,297,843, Cl. 60-39.320.
Ueda, Hiraki: *See*—
Nishi, Takao; Ueda, Hiraki; and Nakagawa, Kazuyuki, 4,298,739, Cl. 546-158.000.
Ueda, Ikuo; Takaya, Takao; Kobayashi, Masakazu; Masugi, Takashi; Takasugi, Hisashi; Kochi, Hiromu; and Kitaguchi, Tadashi, to Fujisawa Pharmaceutical Co., Ltd. Alkoxyimino dioxy butyric acid derivatives. 4,298,529, Cl. 260-340.90R.
Uemura, Yukikazu: *See*—
Sano, Takezo; Inoue, Tadanori; and Uemura, Yukikazu, 4,297,945, Cl. 101-395.000.
Ueno, Takashi; and Nakamura, Kyoichi, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Foams prepared from polypropylene resin composition and process for producing same. 4,298,706, Cl. 521-92.000.
Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Tsutomu; Jikahara, Tomo; and Miyake, Toshiaki, to Zaidan Hojin Biseibutsu Kagaku KenkyuKai. 3',4'-Dideoxykanamycin A and 1-N-(S)-α-hydroxy-ω-aminoalkanoyl) derivatives thereof. 4,298,727, Cl. 536-10.000.
Umezawa, Sumio: *See*—
Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Tsutomu; Jikahara, Tomo; and Miyake, Toshiaki, 4,298,727, Cl. 536-10.000.
Unarco Industries, Inc.: *See*—
Coules, Ronald A., 4,297,769, Cl. 174-138.00D.
Upshaw, Clarence W.; and Goodwin, Richard A., 4,298,127, Cl. 211-126.000.
Union Carbide Corporation: *See*—
Evans, William P.; and Leger, Violeta Z., 4,298,665, Cl. 429-197.000.
Farina, Peter R.; and Grattan, James A., 4,298,735, Cl. 544-257.000.
Szekely, Andrew G., 4,298,377, Cl. 75-53.000.
Union Siderurgique du nord et de l'est de la France ("USINOR"): *See*—
Germain, Alfred; and Bonamour du Tartre, Georges, 4,298,188, Cl. 266-114.000.
Unisearch Limited: *See*—
Hawkins, Laric V., 4,298,967, Cl. 367-57.000.

United Kingdom Atomic Energy Authority: *See—*
James, Robin H.; and Spooner, James A., 4,298,495, Cl. 252-643.000.
United Kingdom of Great Britain and Northern Ireland, Secretary of State for Transport in Her Britannic Majesty's Government of the: *See—*
Hignett, Henry J., 4,298,080, Cl. 175-373.000.
U.S. Industries, Inc.: *See—*
Oldford, William G., 4,297,869, Cl. 72-405.000.
United States of America
Administrator, National Aeronautics and Space Administration: *See—*
Stattel, Raymond J.; and Niswander, James K., 4,298,987, Cl. 375-106.000.
Agriculture: *See—*
Frick, John G., Jr.; and Harper, Robert J., Jr., 4,298,747, Cl. 548-318.000.
McGovern, Terrence P.; and Schreck, Carl E., 4,298,612, Cl. 424-267.000.
Air Force: *See—*
Lee, Henry E., 4,298,942, Cl. 364-483.000.
Romanski, John G., 4,298,858, Cl. 340-146.3MA.
Army: *See—*
Ballard, Arthur H.; and Klein, Theodore J., 4,298,985, Cl. 375-82.000.
Castillo, Tomas R.; and Gardiner, Arthur L., 4,297,939, Cl. 89-33.00L.
Donovan, William F., 4,297,948, Cl. 102-473.000.
Roberts, Eugene L., 4,298,873, Cl. 343-100.0SA.
Energy: *See—*
DeFord, Henry S.; and Clark, Mark L., 4,298,496, Cl. 252-359.00A.
Neuworth, Martin B., 4,298,451, Cl. 208-8.0LE.
O'Brien, Harold A., Jr.; Hupf, Homer B.; and Wanek, Philip M., 4,298,591, Cl. 424-1.000.
Ross, David S.; and Blessing, James E., 4,298,450, Cl. 208-8.0LE.
National Aeronautics and Space Administration: *See—*
Black, James M., 4,298,926, Cl. 363-132.000.
Edwards, John W.; and Smith, John W., 4,298,833, Cl. 318-561.000.
Navy: *See—*
Bosler, Alan J.; and Nash, Larry E., 4,298,905, Cl. 361-386.000.
Bucaro, Joseph A., 4,297,887, Cl. 73-655.000.
Glass, Cecil A.; and Burns, Dallas D., 4,297,949, Cl. 102-229.000.
Lapp, Roger H., 4,298,248, Cl. 350-310.000.
Warnshuis, Paul L., Jr.; and Serrell, Peter V., 4,298,964, Cl. 367-4.000.
U.S. Philips Corporation: *See—*
Bongers, Piet F.; van Tol, Maurits W.; and Robertson, John M., 4,298,820, Cl. 313-463.000.
Colditz, Johannes K. E., 4,298,804, Cl. 376-108.000.
Hodemaekers, Andreas M. L., 4,298,866, Cl. 340-713.000.
Melis, Johannes H. A. M.; and Le Mair, Willem, 4,298,793, Cl. 235-487.000.
Staas, Frans A.; van Haeringen, Willem; and Severijns, Adrianus P., 4,297,856, Cl. 62-514.00R.
van der Veen, Jan; Kivits, Petrus J.; and de Bont, Marinus R. J., 4,298,975, Cl. 369-94.000.
United States Steel Corporation: *See—*
Galer, Herbert W., 4,298,132, Cl. 220-288.000.
United Technologies Corporation: *See—*
Snitzer, Elias; and Meltz, Gerald, 4,298,794, Cl. 250-227.000.
Sundermeyer, Frank D.; and Calcasola, Richard W., 4,298,959, Cl. 364-900.000.
University of California, Regents of the: *See—*
Dauben, William G.; Kessel, Carl R.; and Takemura, Kazuo H., 4,298,752, Cl. 549-42.000.
Fahmy, Mohamed A. H.; and Fukuto, Tetsuo R., 4,298,527, Cl. 260-340.50R.
Fahmy, Mohamed A. H.; and Fukuto, Tetsuo R., 4,298,617, Cl. 424-298.000.
University of Minnesota, The Regents of the: *See—*
Iwasaki, Iwao, 4,298,169, Cl. 241-16.000.
University of Saskatchewan: *See—*
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van den Brom, Guido C., to Lever Brothers Company. Built liquid detergent composition. 4,298,492, Cl. 252-97.000.
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van der Lely, Cornelis. Soil cultivating machines. 4,298,070, Cl. 172-123.000.
van der Veen, Jan; Kivits, Petrus J.; and de Bont, Marinus R. J., to U.S. Philips Corporation. Optical recording medium and method of optically recording information thereon. 4,298,975, Cl. 369-94.000.
Van Eenam, Donald N., to Monsanto Company. Wet strength polymers. 4,298,639, Cl. 427-386.000.
Van Eenam, Donald N., to Monsanto Company. Polyamine/epihalohydrin reaction products. 4,298,715, Cl. 525-340.000.
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Vogel, Edward G.; and Westlund, Rodney C., to Lebanon Steel Foundry. Coherent rigid solid material. 4,298,554, Cl. 264-25.000.

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Volgin, Leonid A.: *See—*
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Walley, Charles E. Mixing device. 4,298,289, Cl. 366-196.000.

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Wright, Thomas C.; Hudrlik, Terrence R.; Mills, Perry A.; Rust, Robert C.; and Wallner, Thomas G., 4,298,007, Cl. 128-419.0PG.

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Walsh, Fraser M., to Kor Incorporated. $^{13}CO_2$ Breath test. 4,298,347, Cl. 23-230.00B.

Walsh, John E., to Dartmouth College; and Walsh, John E., a part interest. Millimeter and sub-millimeter radiation source. 4,298,824, Cl. 315-4.000.

Walter, Helmut: *See—*
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Walters, William R. Energy saver control for outdoor water heater. 4,298,022, Cl. 137-341.000.

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Wang, Cheng L.; Soodak, Charles; and Lohr, David, to Baxter Travenol Laboratories, Inc. Backup control circuit for kidney dialysis machine. 4,298,938, Cl. 364-413.000.

Ward, Daniel L., Jr. Connector clamp. 4,298,291, Cl. 403-205.000.

Ward, Michael A. V. Spherical reentrant chamber. 4,297,983, Cl. 123-536.000.

Ware, Donna L. Motion light device. 4,298,917, Cl. 362-157.000.

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Warner, Gerald T.; and Potter, Colin G. Method of, and apparatus for, monitoring radioactivity. 4,298,796, Cl. 250-328.000.

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Warner & Swasey Company, The: *See—*
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Warnshuis, Paul L., Jr.; and Serrell, Peter V., to United States of America, Navy. Towed deployment of acoustic arrays. 4,298,964, Cl. 367-4.000.

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Watanabe, Masaharu: *See—*
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Watanabe, Minoru; Kume, Kazunari; Ohno, Hideshi; and Tamaru, Munetaka, to Citizen Watch Co. Ltd. Electronic timepiece. 4,297,838, Cl. 368-76.000.

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Watson, James H. P.; and Jones, James P. B., to English Clays Lovering Pochin & Co., Ltd. Method of, and a magnetic separator for, separating magnetizable particles from a fluid. 4,298,478, Cl. 210-695.000.

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Wavre, Alain, to Ateliers des Charmilles, S.A. Method and apparatus for straightening the wire electrode of an electrical discharge machining apparatus. 4,298,782, Cl. 219-69.00M.

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Weigel, Helmut; and Wollenschlager, Werner, to Draloric Electronic GmbH. Capacitor cascade. 4,298,902, Cl. 361-328.000.

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Weinstein, Larry J., to Johns-Manville Corporation. Method and apparatus for measuring flow characteristics of moving fluid stream. 4,297,893, Cl. 73-861.000.

Weintraub, Marvin H.; and Oblinger, Fred. Resistive controller. 4,298,901, Cl. 361-178.000.

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Weisbrod, Alvin J., to Anthony Industries, Inc. Mobile concreting apparatus and method. 4,298,288, Cl. 366-8.000.

Weiss, Arnold A., to AMF Incorporated. Ultrasonic tire testing apparatus. 4,297,876, Cl. 73-146.000.

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Weld, David B. Chumate. 4,297,804, Cl. 43-55.000.

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Wells, John J., Jr.; and Kleine, Donald R., to Wells, John J., Jr. Cheesecake cutting machine. 4,297,932, Cl. 83-581.100.

Weltmer, John T. Mechanized trowel for finishing concrete slabs. 4,298,555, Cl. 264-31.000.

Werner & Pfleiderer: *See—*
Bauer, Erwin; Davids, Ralf; Gotz, Gerhard; Jussen, Hilmar; Arndt, Heinrich; Kummel, Louis; Morhart, Rudolf; and Pollak-Banda, Erich, 4,297,917, Cl. 74-665.00G.

Wesemeyer, Jurgen: *See—*
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West Point Pepperell, Inc.: *See—*
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Daransky, Thomas E.; and Dickinson, John D., 4,298,019, Cl. 137-9.000.
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Fogg, James L., 4,297,776, Cl. 29-252.000.
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Johnston, Paul M., 4,298,839, Cl. 324-157.000.
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Torregrossa, Louis O.; Bentvelzen, Jozef M.; Crosby, Gerald D.; Meredith, Michael D.; and Bepple, Henry, 4,298,426, Cl. 162-57.000.

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Whirlpool Corporation: *See*—
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Williams, Tecwyn L., to Elliott Turbomachinery Limited. Fluid jacket for a vessel. 4,298,060, Cl. 165-169.000.

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Wilpers, Dale J.: *See*—
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Woodworth, Albert H., to Woodworth Carburetor Corp. of Nevada. Carburetor. 4,298,549, Cl. 261-39.00B.

Woodworth Carburetor Corp. of Nevada: *See*—
Woodworth, Albert H., 4,298,549, Cl. 261-39.00B.

Wootton, Gordon; and Moore, Richard W., to Beecham Group Limited. Hydantoin derivatives. 4,298,745, Cl. 548-313.000.

Wozny, Jerome L.: *See*—
Wozny, Philip A.; and Wozny, Jerome L., 4,297,989, Cl. 126-441.000.

Wozny, Philip A.; and Wozny, Jerome L. Solar heat collector. 4,297,989, Cl. 126-441.000.

Wright, Basil M.; and Jones, Thomas P. Gas sampling devices. 4,297,871, Cl. 73-23.000.

Wright, Thomas C.; Hudrlik, Terrence R.; Mills, Perry A.; Rust, Robert C.; and Wallner, Thomas G., to Cardiac Pacemakers, Inc. Atrial rate sensitive cardiac pacer circuit. 4,298,007, Cl. 128-419.0PG.

Wright, William J.: *See*—
Mancini, Derek V.; and Wright, William J., 4,298,137, Cl. 221-11.000.

Wu, Pai-Chuan: *See*—
Cancio, Leopoldo V.; and Wu, Pai-Chuan, 4,298,647, Cl. 428-167.000.

Wudl, Fred: *See*—
Boyd, Gary D.; Mohapatra, Sarat K.; Tell, Benjamin; Wagner, Sigurd; and Wudl, Fred, 4,298,250, Cl. 350-357.000.

Wuerzer, Bruno: *See*—
Hamprecht, Gerhard; Stubenrauch, Gerd; Urbach, Hans; and Wuerzer, Bruno, 4,298,731, Cl. 544-11.000.
Plath, Peter; Rohr, Wolfgang; Wuerzer, Bruno; and Becker, Rainer, 4,298,749, Cl. 548-377.000.

Wulz, Helmut, to Optilon W. Erich Heilmann GmbH. Slide fastener and method of making same. 4,297,770, Cl. 24-205.16R.

Wunning, Joachim, to J. Aichelin. Industrial heating installation and method of operation. 4,298,333, Cl. 431-11.000.

Wydra, Wally. Circular saw blade removing combination. 4,297,921, Cl. 81-3.00R.

Wyman, Floyd H., to Marshall and Williams Company. Drum filter apparatus. 4,298,473, Cl. 210-213.000.

Wyrepak Industries, Inc.: *See*—
Kovaleski, Joseph J., 4,298,174, Cl. 242-128.000.

Xerox Corporation: *See*—
Critchlow, James A.; and Ozern, Donna U., 4,298,275, Cl. 355-71.000.
Duvall, William S.; and English, William K., 4,298,957, Cl. 364-900.000.
Hwa, Stephen C. P., 4,297,972, Cl. 118-658.000.
Lu, Chin H., 4,298,672, Cl. 430-108.000.
Silverberg, Morton, 4,298,277, Cl. 355-76.000.

Yagi, Hideyuki: *See*—
Sakurada, Shuroku; Nakashima, Yoichi; Kojima, Isao; Yagi, Hideyuki; Kariya, Tadaaki; and Sugiyama, Masayoshi, 4,298,881, Cl. 357-38.000.

Yamada, Yujiro: *See*—
Amano, Shoichi; Miyadoh, Shinji; Takahashi, Saeko; Ezaki, Norio; Niwa, Tomizo; and Yamada, Yujiro, 4,298,599, Cl. 424-119.000.
Yamamoto, Hiroshi: *See*—
Kawamura, Masaharu; Shigeta, Yoshihiro; Uchidoi, Masanori; Sugiura, Yoji; and Yamamoto, Hiroshi, 4,298,256, Cl. 354-23.00D.
Yamamoto, Hitoshi: *See*—
Nishikawa, Masao; and Yamamoto, Hitoshi, 4,298,102, Cl. 188-319.000.
Yamamoto, Kenji: *See*—
Ando, Masato; Yamamoto, Kenji; and Taniguchi, Kazuhiro, 4,298,446, Cl. 204-224.00R.
Shichijo, Hajime; Yamamoto, Kenji; and Nakazawa, Kenichi, 4,298,851, Cl. 334-11.000.
Yamamoto, Manabu; Murayama, Seiichi; Ito, Masaru; and Oishi, Kounosuke, to Hitachi, Ltd. Method and apparatus for measuring magnetooptic anisotropy. 4,298,284, Cl. 356-368.000.
Yamanaka, Kunio: *See*—
Takaki, Masaoki; Sawano, Hirokazu; Yamanaka, Kunio; Asada, Kazuyoshi; Hideshima, Keiji; and Koyanagi, Haruo, 4,298,958, Cl. 364-900.000.
Yamashita, Masami: *See*—
Asawa, Tatsuro; Miyake, Haruhisa; Yamashita, Masami; and Sugaya, Yoshio, 4,298,699, Cl. 521-31.000.
Yamashita, Mitsuo: *See*—
Yoshimaru, Tomohisa; Sato, Yasuhiro; and Yamashita, Mitsuo, 4,298,269, Cl. 355-3.00R.
Yamazaki, Noboru; Takase, Tsutomu; Morimoto, Yoshio; and Yuasa, Teruo, to Mitsui Toatsu Chemicals Incorporated. Thermosetting resin composition from maleimide compound and alkenyl phenol. 4,298,720, Cl. 526-262.000.
Yan, Tsoung-yuan; and Lozano, Raymond L., to Mobil Oil Corporation. Leach method including means to protect ion exchange resin. 4,298,578, Cl. 423-7.000.
Yanagidaira, Hidetaka: *See*—
Kawai, Kazuo; Yanagidaira, Hidetaka; and Tamori, Michitoshi, 4,298,983, Cl. 375-12.000.
Yang, Hung H., to Du Pont de Nemours, E. I., and Company. Spinning process. 4,298,565, Cl. 264-181.000.
Yasuda, Shinichiro: *See*—
Ohba, Kenjiro; Izumi, Kaichi; and Yasuda, Shinichiro, 4,298,489, Cl. 252-78.500.
Yasuda, Yoshinobu: *See*—
Kimata, Kei; Yasuda, Yoshinobu; Yoshida, Isamu; and Saruta, Masahiro, 4,297,981, Cl. 123-454.000.
Yates, George A., to Eagle-Picher Industries, Inc. Drill head. 4,298,073, Cl. 173-22.000.
Yeda Research and Development Company, Ltd.: *See*—
Allingham, Yael; and Vofsi, David, 4,298,384, Cl. 106-18.340.
Levin, Gideon; and Vofsi, David, 4,298,714, Cl. 525-330.000.
Yelnosky, John: *See*—
Condouris, George A.; Yelnosky, John; Riley, Richard L.; Won, Chong M.; Douglas, George H.; and Studt, William L., 4,298,608, Cl. 424-249.000.
Yesair, David W.: *See*—
Sears, Barry; and Yesair, David W., 4,298,594, Cl. 424-19.000.
Yokogawa Electric Works, Ltd.: *See*—
Ikeda, Kyoichi; and Ando, Motoyoshi, 4,297,872, Cl. 73-32.00A.
Yokota, Shozo: *See*—
Arai, Yoshio; Kataoka, Hiroyuki; Suzuki, Isao; and Yokota, Shozo, 4,298,895, Cl. 358-284.000.
Yoshida, Isamu: *See*—
Kimata, Kei; Yasuda, Yoshinobu; Yoshida, Isamu; and Saruta, Masahiro, 4,297,981, Cl. 123-454.000.
Yoshida Kogyo, K.K.: *See*—
Takahashi, Kihei; Terada, Seiko; and Nakada, Kiyoshi, 4,298,033, Cl. 139-450.000.
Yoshida, Takao, to International Flavors & Fragrances Inc. Neophyl manganese chloride. 4,298,542, Cl. 260-429.00R.
Yoshimaru, Tomohisa; Sato, Yasuhiro; and Yamashita, Mitsuo, to Tokyo Shibaura Denki Kabushiki Kaisha. Recordable reader printer and electrostatic copier. 4,298,269, Cl. 355-3.00R.
Yoshimura, Shigeru; Nomura, Akihiro; and Hayakawa, Kimiaki, to Canon Kabushiki Kaisha. Copying apparatus having an original feeding mechanism. 4,298,279, Cl. 355-133.000.
Youn, Kun C.; and Wilpers, Dale J., to Shell Oil Company. Process for oilseed extraction with an isopropanol-based solvent. 4,298,540, Cl. 260-412.400.
Young, James E., to Emerson Electric Co. Field replaceable electrode assembly for magnetic flowmeter. 4,297,897, Cl. 73-861.120.
Young, Lewis B., to Mobil Oil Corporation. Preparation of improved alkylphenylsulfonates. 4,298,547, Cl. 260-505.00A.
Yuasa, Teruo: *See*—
Yamazaki, Noboru; Takase, Tsutomu; Morimoto, Yoshio; and Yuasa, Teruo, 4,298,720, Cl. 526-262.000.
Zagaroli & Company: *See*—
Zagaroli, David, 4,297,952, Cl. 108-83.000.
Zagaroli, David, to Zagaroli & Company. Expandable table. 4,297,952, Cl. 108-83.000.
Zahid, Abduz, to Greer Hydraulics, Incorporated. Pressure pulse dampener device. 4,298,029, Cl. 138-30.000.
Zahner, John C.: *See*—
Schoennagel, Hans-Juergen; and Zahner, John C., 4,298,453, Cl. 208-10.000.
Zahnraderfabrik Renk Aktiengesellschaft: *See*—
Bauer, Erwin; Davids, Ralf; Gotz, Gerhard; Jussen, Hilmar; Arndt, Heinrich; Kummel, Louis; Morhart, Rudolf; and Pollak-Banda, Erich, 4,297,917, Cl. 74-665.00G.
Zaidan Hojin Biseibutsu Kagaku KenkyuKai: *See*—
Umezawa, Hamao; Umezawa, Sumio; Tsuchiya, Tsutomu; Jikahara, Tomo; and Miyake, Toshiaki, 4,298,727, Cl. 536-10.000.
Zaidan Hojin Handotai Kenkyu Shinkokai: *See*—
Okuno, Yasuo, 4,298,869, Cl. 340-782.000.
Zambrano, Adolfo R., to Hanna Mining Company, The. Production of high purity and high surface area magnesium oxide. 4,298,379, Cl. 75-82.000.
Zampino, Arthur T.; and Zampino, Dolores V. Combination feeding tray and play table. 4,298,228, Cl. 297-182.000.
Zampino, Dolores V.: *See*—
Zampino, Arthur T.; and Zampino, Dolores V., 4,298,228, Cl. 297-182.000.
Zarbos, Catherine. Torso garment incorporating removable hand coverings. 4,297,746, Cl. 2-108.000.
Zecher, Wilfried: *See*—
Lewalter, Jurgen; Rottmaier, Ludwig; Merten, Rudolf; Zecher, Wilfried; Dunwald, Willi; and Schulte, Bernhard, 4,298,515, Cl. 260-30.40N.
Zeigner, Willard L.: *See*—
Blaney, Peter G.; Conley, Dwain D.; and Zeigner, Willard L., 4,297,899, Cl. 73-861.580.
Zeitlin, Robert J.: *See*—
Machonis, John, Jr.; Schmukler, Seymour; Zeitlin, Robert J.; and Shida, Mitsuzo, 4,298,712, Cl. 525-74.000.
Zelenka, Leslie R.: *See*—
Arter, Nelson K.; Devore, Ernest W.; Wills, Arthur B.; and Zelenka, Leslie R., 4,298,897, Cl. 360-39.000.
Zelentsov, Boris N.: *See*—
Avdeenko, Boris K.; Bronfman, Aron I.; Vitkin, Alexandr L.; Zelentsov, Boris N.; Kinevsky, Valery N.; and Rozet, Vladimir E., 4,298,900, Cl. 361-127.000.
Zeller, Norbert: *See*—
Schinabeck, Anton; Zeller, Norbert; Lindner, Tassilo; Engelsberger, Georg; and Riedle, Rudolf, 4,298,753, Cl. 556-415.000.
Zemco, Inc.: *See*—
Blaney, Peter G.; Conley, Dwain D.; and Zeigner, Willard L., 4,297,899, Cl. 73-861.580.
Zenith Radio Corporation: *See*—
Ishihara, Theodore M.; and Kulkens, John F., 4,298,815, Cl. 313-325.000.
Lai, Stephen; and Srivastava, Gopal K., 4,298,890, Cl. 358-158.000.
Reneau, Daniel L., 4,298,884, Cl. 358-26.000.
Zhirnov, Nikolai Y.: *See*—
Batalin, Oleg E.; Dykman, Arkady S.; Osadchenko, Alexandr I.; Balkhanova, Galina F.; Belgorodsky, Izrail M.; Nevstruev, Vladimir I.; Radionov, Valery A.; Tulchinsky, Eduard A.; Belyaev, Valentin M.; Smolin, Jury I.; Breiman, Mark I.; Orlyansky, Vitaly V.; Zhirnov, Nikolai Y.; Galibin, Nikolai V.; Troitsky, Adrian P.; and Kovalenko, Vladimir V., 4,298,503, Cl. 252-432.000.
Zimmer, Ernst, to Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft. Leverage system. 4,297,908, Cl. 74-469.000.
Zimmerman, C. Lyle. Basement dewatering system. 4,298,294, Cl. 405-37.000.
Zimmerman, Robert L.: *See*—
Schulze, Heinz; Zimmerman, Robert L.; and Naylor, Carter G., 4,298,708, Cl. 521-115.000.
Zimmermann, Andreas: *See*—
Muller, Klaus; and Zimmermann, Andreas, 4,298,448, Cl. 204-299.00R.
Zodrow, Rudolf, to Jagenberg-Werke AG. Labelling machine. 4,298,422, Cl. 156-568.000.
Zoecon Corporation: *See*—
Lee, Shy-Fuh, 4,298,760, Cl. 562-506.000.
Zoller, Christopher J.: *See*—
Mahnke, Earl A.; and Zoller, Christopher J., 4,298,864, Cl. 340-657.000.
Zuniga, Julio A. Box spring and mattress support device. 4,297,754, Cl. 5-411.000.
Zvyagin, Mikhail S.: *See*—
Bochkarev, Ellin P.; Prokopov, Igor V.; Eljutin, Alexandr V.; Belsky, Arkady A.; Baryshnikova, Svetlana M.; Nasyrov, Nail Z.; Novikov, Nikolai A.; Khairulin, Edige R.; Zvyagin, Mikhail S.; Abrjutin, Vladimir N.; Konstantinova, Ljubov I.; Ljubimova, Nina A.; and Gorbacheva, Nadezhda S., 4,298,380, Cl. 75-101.0BE.

# LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 3RD DAY OF NOVEMBER, 1981

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Du Pont de Nemours, E. I., and Company: *See*—
Pilgrim, James F.; and Hunter, Ronald A., Re. 30,789, Cl. 427-358.000.

Hunter, Ronald A.: *See*—
Pilgrim, James F.; and Hunter, Ronald A., Re. 30,789, Cl. 427-358.000.

Pilgrim, James F.; and Hunter, Ronald A., to Du Pont de Nemours, E. I., and Company. Process for coating sheet substrates with thermoplastic polymer. Re. 30,789, Cl. 427-358.000.

Pool, Danny L.; and Pool, Robert R. Hand held masking machine. Re. 30,787, Cl. 156-527.000.

Pool, Robert R.: *See*—
Pool, Danny L.; and Pool, Robert R., Re. 30,787, Cl. 156-527.000.

Wiebe, Gerald L. Disposable identification band blank. Re. 30,786, Cl. 40-21.00C.

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# LIST OF DESIGN PATENTEES

Abe, Takeshi: *See*—
Seki, Yasusuke; and Abe, Takeshi, 261,643, Cl. D14-5.000.

Abraham, Anthony S., to Lever Brothers Company. Soap or detergent tablet. 261,691, 11-3-81, Cl. D28-8.100.

Aktiebolaget Cloetta: *See*—
Svensson, Thure; and Brandstrom, Jan, 261,656, Cl. D15-111.000.

Alber, Friedrich; Altmann, Gerhard; Bendel, Wolfgang; Dedelmahr, Rudolf; Eyrich, Hermann; Link, Rudolf; and Seeliger, Klaus, to Transormatoren Union Aktiengesellschaft. Coupling transformer. 261,640, 11-3-81, Cl. D13-4.000.

Albertson, Robert V. Ratchet wrench fulcrum ring. 261,607, 11-3-81, Cl. D8-25.000.

Altmann, Gerhard: *See*—
Alber, Friedrich; Altmann, Gerhard; Bendel, Wolfgang; Dedelmahr, Rudolf; Eyrich, Hermann; Link, Rudolf; and Seeliger, Klaus, 261,640, Cl. D13-4.000.

American Hospital Supply Corporation: *See*—
Herbst, Walter B., 261,586, Cl. D7-16.000.
Herbst, Walter B., 261,587, Cl. D7-16.000.
Herbst, Walter B., 261,589, Cl. D7-38.000.
Herbst, Walter B., 261,590, Cl. D7-40.000.
Herbst, Walter B., 261,591, Cl. D7-40.000.

Anderson, Howard A., to Cities Service Company. Dish pan. 261,602, 11-3-81, Cl. D32-55.000.

Asher, James C.: *See*—
McKinsey, Kevin P.; and Asher, James C., 261,644, Cl. D14-11.000.

Atari, Inc.: *See*—
McKinsey, Kevin P.; and Asher, James C., 261,644, Cl. D14-11.000.

Audesse, Emery G.; and Hartman, Donald W., to GTE Products Corporation. Linear multilamp photoflash unit. 261,683, 11-3-81, Cl. D26-2.000.

Aulenti, Gae, to Knoll International, Inc. Chair. 261,580, 11-3-81, Cl. D6-66.000.

Austin, John J., Jr., to Champion International Corporation. Carton. 261,617, 11-3-81, Cl. D9-432.000.

B. F. Goodrich Company, The: *See*—
Skerl, Richard J., 261,635, Cl. D12-147.000.
Skerl, Richard J., 261,636, Cl. D12-147.000.

Babb, Burton A. Loudspeaker. 261,642, 11-3-81, Cl. D14-30.000.

Babb, Burton A. Loudspeaker. 261,645, 11-3-81, Cl. D14-30.000.

Bachmann, Hans. Garbage compactor. 261,658, 11-3-81, Cl. D15-123.000.

Bane, John H., III. Space heating stove. 261,675, 11-3-81, Cl. D23-97.000.

Beck, Robert F., Jr. Campfire cook stand. 261,596, 11-3-81, Cl. D7-109.000.

Bedwell, Bernice. Eyeglasses. 261,662, 11-3-81, Cl. D16-104.000.

Bendel, Wolfgang: *See*—
Alber, Friedrich; Altmann, Gerhard; Bendel, Wolfgang; Dedelmahr, Rudolf; Eyrich, Hermann; Link, Rudolf; and Seeliger, Klaus, 261,640, Cl. D13-4.000.

Bernard Industries Co.: *See*—
Yellin, Bernard, 261,595, Cl. D7-99.000.

Beshears, Terry W. Roofing roll dispenser. 261,634, 11-3-81, Cl. D34-24.000.

Blanchard, Russell O.; Guzek, Joseph; and Matt, Donald A., to Motor Wheel Corporation. Wheel. 261,637, 11-3-81, Cl. D12-209.000.

Blanchard, Russell O.; Guzek, Joseph; and Matt, Donald A., to Motor Wheel Corporation. Wheel. 261,638, 11-3-81, Cl. D12-209.000.

Boldt, Melvin H.; Morrison, Thurber H.; and Greb, Francis J., to National Presto Industries, Inc. Egg cooker. 261,594, 11-3-81, Cl. D7-94.000.

Borkan, Florence, to Pharmacaps, Inc. Combined bottle cap and capsule piercing device. 261,619, 11-3-81, Cl. D9-437.000.

Brandstrom, Jan: *See*—
Svensson, Thure; and Brandstrom, Jan, 261,656, Cl. D15-111.000.

Brannock, Thomas L. Load binder release tool. 261,611, 11-3-81, Cl. D8-89.000.

Brun, George F., Jr.: *See*—
Ogg, Elmer E., Jr.; and Brun, George F., Jr., 261,668, Cl. D19-92.000.

Buchanan, Edward B. Fishing rod holder. 261,581, 11-3-81, Cl. D6-125.000.

Champion International Corporation: *See*—
Austin, John J., Jr., 261,617, Cl. D9-432.000.
Scott, Raymond G.; and Wysocki, Lawrence S., 261,620, Cl. D9-438.000.

Chandler, John W. Orthopedic pillow. 261,681, 11-3-81, Cl. D24-64.000.

Charland, Terrence D.; Newcomb, Dean R.; and Robertson, Donald A., to Xerox Corporation. Copying machine. 261,661, 11-3-81, Cl. D16-31.000.

Cities Service Company: *See*—
Anderson, Howard A., 261,602, Cl. D32-55.000.

Coburn, Orin W.: *See*—
Maloy, Rex M., 261,664, Cl. D18-3.000.

Cohen, Aaron G.: *See*—
Melzian, John M.; Cohen, Aaron G.; and Nuttall, Mike, 261,670, Cl. D21-64.000.

Collister, Kenneth D.; Krou, Michael A.; and Werner, Raymond M., to Miles Laboratories, Inc. Reflectance colorimeter. 261,623, 11-3-81, Cl. D10-46.000.

Coulter Systems Corporation: *See*—
Forrest, Jess; and Hardy, Carl D., 261,660, Cl. D16-31.000.

Dedelmahr, Rudolf: *See*—
Alber, Friedrich; Altmann, Gerhard; Bendel, Wolfgang; Dedelmahr, Rudolf; Eyrich, Hermann; Link, Rudolf; and Seeliger, Klaus, 261,640, Cl. D13-4.000.

deHaseth, John, to Jonee, Inc. Combined brush and mirror. 261,693, 11-3-81, Cl. D28-68.000.

Delgado, Elsa L.; and Pinera, Julia M. Desk pen set holder. 261,665, 11-3-81, Cl. D19-77.000.

Deschamps, Robert L., to Shure Brothers, Inc. Power console. 261,652, 11-3-81, Cl. D14-96.000.

Docan Corporation: *See*—
Doheny, Kevin L., 261,629, Cl. D10-106.000.

Doheny, Kevin L., to Docan Corporation. Emergency brake warning device. 261,629, 11-3-81, Cl. D10-106.000.

Enders, Roy L. Hide-a-bed mover clamp. 261,584, 11-3-81, Cl. D6-198.000.

Enduro Corporation: *See*—
Kettlestrings, John S., 261,601, Cl. D32-40.000.

Eyrich, Hermann: *See*—
Alber, Friedrich; Altmann, Gerhard; Bendel, Wolfgang; Dedelmahr, Rudolf; Eyrich, Hermann; Link, Rudolf; and Seeliger, Klaus, 261,640, Cl. D13-4.000.

Farino, Robert J. Angle converter. 261,625, 11-3-81, Cl. D10-65.000.

Fear, Jeffrey R. Combined stool and footrest. 261,575, 11-3-81, Cl. D6-35.000.

Fee, Robert W.; Ten Eyck, Richard E.; and Smith, Lloyd T., to S/V Tool Company, Inc. Hand implement. 261,610, 11-3-81, Cl. D8-82.000.

Feuling, James J. Mounting stand for attaching an accessory to an engine. 261,654, 11-3-81, Cl. D15-5.000.

Fichte, Heinrich. Serving tray unit. 261,588, 11-3-81, Cl. D7-38.000.

Fisher, Carlman: *See*—
Gordon, Andrew W.; and Fisher, Carlman, 261,570, Cl. D2-318.000.

Forbes, Hampton E., Jr., to Westvaco Corporation. Bottled alcoholic beverage carton. 261,613, 11-3-81, Cl. D9-418.000.

Forrest, Jess; and Hardy, Carl D., to Coulter Systems Corporation. Photoprinting machine. 261,660, 11-3-81, Cl. D16-31.000.

Fukano, Katsuhito; and Mawake, Yukio, to Mitutoyo Mfg., Co., Ltd. Three-dimensional coordinate measuring instrument. 261,624, 11-3-81, Cl. D10-46.000.

Gagliano, Stephen J. Winged sculpture. 261,633, 11-3-81, Cl. D11-162.000.

Gannon, Robert E.: *See*—
Tesar, Robert J.; and Gannon, Robert E., 261,616, Cl. D9-415.000.

Gardisette International AG: *See*—
Stocker, Hans, 261,694, Cl. D47-6.00E.

Genaro, Donald M.; McGarvey, John N.; and Novak, Lajos, to Western Electric Company, Inc. Combined telephone kiosk and support therefor. 261,582, 11-3-81, Cl. D6-181.000.

General Electric Company: *See*—
Kolwaite, John S., 261,651, Cl. D14-73.000.

George, Wilfred R. Newspaper grate. 261,603, 11-3-81, Cl. D7-207.000.

Gordon, Andrew W.; and Fisher, Carlman, to Northern Shoe Bindings Co., Inc. Contoured sandal innersole. 261,570, 11-3-81, Cl. D2-318.000.

Greb, Francis J.: *See*—
Boldt, Melvin H.; Morrison, Thurber H.; and Greb, Francis J., 261,594, Cl. D7-94.000.

Greene & Kellogg, Inc.: *See*—
McCombs, Norman R., 261,676, Cl. D24-8.000.

Griggs, Denis O. Hockey target. 261,667, 11-3-81, Cl. D21-6.000.

GTE Products Corporation: *See*—
Audesse, Emery G.; and Hartman, Donald W., 261,683, Cl. D26-2.000.

Gunnell, Carl F., III. Pump flange tool. 261,608, 11-3-81, Cl. D8-27.000.

Guzek, Joseph: *See*—
Blanchard, Russell O.; Guzek, Joseph; and Matt, Donald A., 261,637, Cl. D12-209.000.
Blanchard, Russell O.; Guzek, Joseph; and Matt, Donald A., 261,638, Cl. D12-209.000.

Hall, Richard, to Technalytics, Inc. Naso-gastric tube stabilizer. 261,680, 11-3-81, Cl. D24-53.000.

Hanson, George A. Tackle caddy. 261,571, 11-3-81, Cl. D3-38.000.

Harada, Toshio: *See*—
Takahashi, Yoichi; Yamamura, Masamichi; Harada, Toshio; and Inoue, Shigefumi, 261,598, Cl. D7-128.000.
Takahashi, Yoichi; Itsumi, Kenjiro; Harada, Toshio; and Inoue, Shigefumi, 261,599, Cl. D7-128.000.

Hardy, Carl D.: *See*—
Forrest, Jess; and Hardy, Carl D., 261,660, Cl. D16-31.000.

Hartman, Donald W.: *See*—
Audesse, Emery G.; and Hartman, Donald W., 261,683, Cl. D26-2.000.

Henkels, Walter. Combined ruler and letter opener. 261,612, 11-3-81, Cl. D8-104.000.

Herbst, Walter B., to American Hospital Supply Corporation. Covered food tray. 261,586, 11-3-81, Cl. D7-16.000.

Herbst, Walter B., to American Hospital Supply Corporation. Covered food tray. 261,587, 11-3-81, Cl. D7-16.000.

Herbst, Walter B., to American Hospital Supply Corporation. Food tray. 261,589, 11-3-81, Cl. D7-38.000.

Herbst, Walter B., to American Hospital Supply Corporation. Lid for a food tray. 261,590, 11-3-81, Cl. D7-40.000.

Herbst, Walter B., to American Hospital Supply Corporation. Food tray lid. 261,591, 11-3-81, Cl. D7-40.000.

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Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

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**CLASS 42**

| | |
|---|---|
| 49 A | 4,297,800 |
| 59 | 4,297,801 |

**CLASS 43**

| | |
|---|---|
| 4 | 4,297,802 |
| 7 | 4,297,803 |
| 55 | 4,297,804 |
| 83.5 | 4,297,805 |

**CLASS 44**

| | |
|---|---|
| 1 C | 4,298,349 |
| | 4,298,350 |
| 53 | 4,298,351 |
| | 4,298,352 |
| 56 | 4,298,356 |
| 71 | 4,298,353 |

**CLASS 46**

| | |
|---|---|
| 1 C | 4,297,806 |
| 4 | 4,297,807 |
| 52 | 4,297,808 |
| 74 D | 4,297,809 |

**CLASS 47**

| | |
|---|---|
| 9 | 4,297,810 |
| 72 | 4,297,811 |

**CLASS 48**

| | |
|---|---|
| 206 | 4,298,355 |

**CLASS 49**

| | |
|---|---|
| 386 | 4,297,812 |

**CLASS 51**

| | |
|---|---|
| 297 | 4,298,356 |

**CLASS 52**

| | |
|---|---|
| 2 | 4,297,813 |
| 81 | 4,297,814 |
| 115 | 4,297,815 |
| 125 | 4,297,816 |
| 169.6 | 4,297,817 |
| 199 | 4,297,818 |
| 293 | 4,297,819 |
| 309.11 | 4,297,820 |
| 317 | 4,297,821 |
| 484 | 4,297,822 |
| 514 | 4,297,823 |
| 568 | 4,297,824 |
| 729 | 4,297,825 |

**CLASS 53**

| | |
|---|---|
| 157 | 4,297,826 |
| 282 | 4,297,827 |
| | 4,297,828 |

**CLASS 55**

| | |
|---|---|
| 165 | 4,298,357 |
| 185 | 4,298,358 |
| 269 | 4,298,359 |
| 273 | 4,298,360 |
| 290 | 4,298,361 |
| 304 | 4,298,362 |

**CLASS 56**

| | |
|---|---|
| 11.3 | 4,297,829 |
| 13.6 | 4,297,830 |
| 295 | 4,297,831 |
| 328 R | 4,297,832 |
| 364 | 4,297,833 |

**CLASS 57**

| | |
|---|---|
| 58.86 | 4,297,834 |
| 251 | 4,297,835 |
| 291 | 4,297,836 |
| 350 | 4,297,837 |

**CLASS 59**

| | |
|---|---|
| 85 | 4,297,839 |
| | 4,297,840 |

**CLASS 60**

| | |
|---|---|
| 39.06 | 4,297,842 |
| 39.3 | 4,297,841 |
| 39.32 | 4,297,843 |
| 226 A | 4,297,844 |
| 384 | 4,297,845 |
| 585 | 4,297,846 |
| 641.3 | 4,297,847 |
| 660 | 4,297,848 |

**CLASS 62**

| | |
|---|---|
| 3 | 4,297,849 |
| | 4,297,850 |
| 21 | 4,298,363 |
| 126 | 4,297,851 |
| 153 | 4,297,852 |
| 325 | 4,297,853 |
| | 4,297,854 |
| | 4,297,855 |
| 514 R | 4,297,856 |

**CLASS 65**

| | |
|---|---|
| 3.11 | 4,298,364 |
| 3.12 | 4,298,365 |
| | 4,298,366 |
| 4.1 | 4,298,367 |
| 25.2 | 4,298,368 |
| 27 | 4,298,369 |
| | 4,298,370 |
| 29 | 4,298,371 |
| 136 | 4,298,372 |
| 260 | 4,298,373 |
| 335 | 4,298,374 |

**CLASS 66**

| | |
|---|---|
| 9 R | 4,297,857 |
| 194 | 4,297,858 |

**CLASS 68**

| | |
|---|---|
| 13 R | 4,297,859 |
| 200 | 4,297,860 |

**CLASS 70**

| | |
|---|---|
| 55 | 4,297,861 |
| 129 | 4,297,862 |
| 395 | 4,297,863 |
| 456 B | 4,297,864 |

**CLASS 71**

| | |
|---|---|
| 90 | 4,298,375 |

**CLASS 72**

| | |
|---|---|
| 146 | 4,297,865 |
| 186 | 4,297,866 |
| 347 | 4,297,867 |
| 402 | 4,297,868 |
| 405 | 4,297,869 |
| 443 | 4,297,870 |

**CLASS 73**

| | |
|---|---|
| 23 | 4,297,871 |
| 32 A | 4,297,872 |
| 61 LM | 4,297,873 |
| 73 | 4,297,874 |
| 146 | 4,297,876 |
| | 4,297,877 |
| | 4,297,878 |
| 152 | 4,297,879 |
| 155 | 4,297,880 |
| 204 | 4,297,881 |
| 460 | 4,297,882 |
| 504 | 4,297,883 |
| 579 | 4,297,884 |
| 587 | 4,297,885 |
| 642 | 4,297,886 |
| 655 | 4,297,887 |
| 664 | 4,297,888 |
| 747 | 4,297,889 |
| 753 | 4,297,890 |
| 756 | 4,297,891 |
| 826 | 4,297,892 |
| 861 | 4,297,893 |
| 861.03 | 4,297,894 |
| 861.12 | 4,297,895 |
| | 4,297,896 |
| | 4,297,897 |
| 861.22 | 4,297,898 |
| 861.58 | 4,297,899 |
| 861.66 | 4,297,900 |
| 862.53 | 4,297,901 |
| 862.62 | 4,297,875 |
| 863.33 | 4,297,902 |
| 864.13 | 4,298,575 |
| 864.22 | 4,297,903 |

**CLASS 74**

| | |
|---|---|
| 5 F | 4,297,904 |
| 5.43 | 4,297,905 |
| 410 | 4,297,906 |
| 417 | 4,297,907 |
| 469 | 4,297,908 |
| 473 R | 4,297,909 |
| | 4,297,910 |
| 501 R | 4,297,912 |
| | 4,297,913 |
| 532 | 4,297,914 |
| | 4,297,915 |
| 544 | 4,297,916 |
| 665 G | 4,297,917 |
| 690 | 4,297,918 |
| 750 R | 4,297,919 |
| 804 | 4,297,920 |

**CLASS 75**

| | |
|---|---|
| 49 | 4,298,376 |
| 53 | 4,298,377 |
| 60 | 4,298,378 |
| 82 | 4,298,379 |
| 101 BE | 4,298,380 |
| 124 | 4,298,381 |
| 202 | 4,298,382 |
| 211 | 4,298,383 |

**CLASS 81**

| | |
|---|---|
| 3 R | 4,297,921 |
| 57.18 | 4,297,922 |
| 57.41 | 4,297,923 |
| 59.1 | 4,297,924 |

**CLASS 82**

| | |
|---|---|
| 2 R | 4,297,925 |
| 9 | 4,297,926 |

**CLASS 83**

| | |
|---|---|
| 36 | 4,297,927 |
| 57 | 4,297,928 |
| 110 | 4,297,929 |
| 156 | 4,297,930 |
| 397 | 4,297,931 |
| 581.1 | 4,297,932 |

**CLASS 84**

| | |
|---|---|
| 1.01 | 4,297,933 |
| | 4,297,935 |
| 1.03 | 4,297,934 |
| 314 R | 4,297,936 |
| 430 | 4,297,937 |
| 455 | 4,297,938 |

**CLASS 89**

| | |
|---|---|
| 33 L | 4,297,939 |

**CLASS 98**

| | |
|---|---|
| 33 R | 4,297,940 |

**CLASS 99**

| | |
|---|---|
| 332 | 4,297,941 |
| 386 | 4,297,942 |

**CLASS 100**

| | |
|---|---|
| 129 | 4,297,943 |

**CLASS 101**

| | |
|---|---|
| 93.31 | 4,297,944 |
| 395 | 4,297,945 |

**CLASS 102**

| | |
|---|---|
| 229 | 4,297,949 |
| 307 | 4,297,946 |
| 473 | 4,297,948 |

**CLASS 104**

| | |
|---|---|
| 172 BT | 4,297,950 |
| 209 | 4,297,951 |

**CLASS 106**

| | |
|---|---|
| 18.34 | 4,298,384 |
| 98 | 4,298,392 |
| 100 | 4,298,393 |
| 111 | 4,298,394 |
| 163 R | 4,298,395 |
| 273 R | 4,298,396 |
| 274 | 4,298,397 |
| 288 Q | 4,298,398 |
| 309 | 4,298,399 |

**CLASS 108**

| | |
|---|---|
| 83 | 4,297,952 |
| 131 | 4,297,953 |

**CLASS 112**

| | |
|---|---|
| 104 | 4,297,954 |
| 121.15 | 4,297,955 |
| 158 A | 4,297,956 |
| 184 | 4,297,957 |
| 220 | 4,297,958 |

**CLASS 113**

| | |
|---|---|
| 116 HH | 4,297,959 |

**CLASS 114**

| | |
|---|---|
| 74 A | 4,297,960 |
| 123 | 4,297,961 |
| 218 | 4,297,962 |
| 230 | 4,297,963 |
| 263 | 4,297,964 |
| 265 | 4,297,965 |

**CLASS 116**

| | |
|---|---|
| 277 | 4,297,966 |

**CLASS 118**

| | |
|---|---|
| 117 | 4,297,967 |
| 249 | 4,297,968 |
| 652 | 4,297,969 |
| | 4,297,970 |
| 658 | 4,297,972 |
| 719 | 4,297,971 |

**CLASS 119**

| | |
|---|---|
| 3 | 4,297,973 |
| 51 R | 4,297,974 |

**CLASS 123**

| | |
|---|---|
| 193 CP | 4,297,976 |
| 193 P | 4,297,975 |
| 320 | 4,297,977 |
| 339 | 4,297,978 |
| 372 | 4,297,979 |
| 438 | 4,297,980 |
| 454 | 4,297,981 |
| 502 | 4,297,982 |
| 536 | 4,297,983 |
| 587 | 4,297,984 |

**CLASS 124**

| | |
|---|---|
| 22 | 4,297,985 |

**CLASS 126**

| | |
|---|---|
| 121 | 4,297,986 |
| 351 | 4,297,987 |
| 439 | 4,297,988 |
| 441 | 4,297,989 |
| 445 | 4,297,990 |
| 448 | 4,297,991 |

**CLASS 127**

| | |
|---|---|
| 29 | 4,298,400 |

**CLASS 128**

| | |
|---|---|
| 77 | 4,297,992 |
| 92 D | 4,297,993 |
| 133 | 4,297,994 |
| 156 | 4,297,995 |
| 169 | 4,297,996 |
| | 4,297,997 |
| 204.26 | 4,297,998 |
| 205.16 | 4,297,999 |
| 218 A | 4,298,000 |
| 247 | 4,298,001 |
| 260 | 4,298,002 |
| | 4,298,003 |
| 305 | 4,298,004 |
| 396 | 4,298,005 |
| 399 | 4,298,006 |
| 419 PG | 4,298,007 |
| 477 | 4,298,008 |
| 660 | 4,298,009 |
| 719 | 4,298,010 |
| 763 | 4,298,011 |

**CLASS 131**

| | |
|---|---|
| 296 | 4,298,012 |
| 308 | 4,298,013 |

**CLASS 132**

| | |
|---|---|
| 9 | 4,298,014 |

**CLASS 134**

| | |
|---|---|
| 100 | 4,298,015 |

**CLASS 135**

| | |
|---|---|
| 67 | 4,298,016 |

**CLASS 136**

| | |
|---|---|
| 202 | 4,298,768 |

**CLASS 137**

| | |
|---|---|
| 1 | 4,298,017 |
| 3 | 4,298,018 |
| 9 | 4,298,019 |
| 315 | 4,298,020 |
| 334 | 4,298,021 |
| 341 | 4,298,022 |
| 529 | 4,298,023 |
| 624.11 | 4,298,024 |
| 624.14 | 4,298,025 |
| 625.47 | 4,298,026 |
| 625.65 | 4,298,027 |
| 868 | 4,298,028 |

**CLASS 138**

| | |
|---|---|
| 30 | 4,298,029 |
| | 4,298,030 |

**CLASS 139**

| | |
|---|---|
| 55.1 | 4,298,031 |
| 207 | 4,298,032 |
| 450 | 4,298,033 |
| 453 | 4,298,034 |

**CLASS 141**

| | |
|---|---|
| 1 | 4,298,035 |
| | 4,298,036 |
| | 4,298,037 |
| 2 | 4,298,038 |
| 90 | 4,298,039 |
| 115 | 4,298,040 |
| 392 | 4,298,041 |

**CLASS 144**

| | |
|---|---|
| 2 Z | 4,298,042 |
| 136 R | 4,298,043 |
| 176 | 4,298,044 |

**CLASS 148**

| | |
|---|---|
| 1.5 | 4,298,401 |
| | 4,298,402 |
| | 4,298,403 |
| 6.14 A | 4,298,404 |
| 6.15 R | 4,298,405 |
| 12 B | 4,298,406 |
| 24 | 4,298,407 |
| 32 | 4,298,408 |
| 108 | 4,298,409 |
| 172 | 4,298,410 |

**CLASS 149**

| | |
|---|---|
| 19.4 | 4,298,411 |
| 19.5 | 4,298,412 |

**CLASS 150**

| | |
|---|---|
| 0.5 | 4,298,045 |

**CLASS 152**

| | |
|---|---|
| 209 R | 4,298,046 |
| 417 | 4,298,047 |

**CLASS 156**

| | |
|---|---|
| 42 | 4,298,413 |
| 59 | 4,298,414 |
| 85 | 4,298,415 |
| 87 | 4,298,416 |
| 228 | 4,298,417 |
| 296 | 4,298,418 |
| 345 | 4,298,419 |
| 394 R | 4,298,420 |
| 460 | 4,298,421 |
| 527 | Re.30,787 |
| 568 | 4,298,422 |
| 616 R | 4,298,423 |
| 668 | 4,298,424 |

**CLASS 160**

| | |
|---|---|
| 243 | 4,298,048 |

**CLASS 162**

| | |
|---|---|
| 18 | 4,298,425 |
| 57 | 4,298,426 |
| | 4,298,427 |
| 73 | 4,298,428 |
| 343 | 4,298,429 |

**CLASS 164**

| | |
|---|---|
| 30 | 4,298,049 |
| 72 | 4,298,051 |
| 416 | 4,298,052 |
| 429 | 4,298,053 |
| 468 | 4,298,050 |

**CLASS 165**

1 4,298,054
9 4,298,055
12 4,298,056
159 4,298,057
161 4,298,058
166 4,298,059
169 4,298,060
170 4,298,061
181 4,298,062

**CLASS 166**

55 4,298,063
75 A 4,298,064
88 4,298,065
300 4,298,066
315 4,298,067

**CLASS 169**

39 4,298,068

**CLASS 172**

59 4,298,069
123 4,298,070
624 4,298,071

**CLASS 173**

13 4,298,072
22 4,298,073
129 4,298,074
4,298,075
164 4,298,076

**CLASS 174**

52 FP 4,298,769
68.5 4,298,770
71 B 4,298,771
138 D 4,297,769

**CLASS 175**

65 4,298,077
72 4,298,078
339 4,298,079
373 4,298,080

**CLASS 176**

290 4,298,431

**CLASS 177**

187 4,298,081

**CLASS 178**

18 4,298,772
30 4,298,773

**CLASS 179**

18 BG 4,298,774
81 R 4,298,775

**CLASS 180**

65 R 4,298,082
125 4,298,083
131 4,298,084
247 4,298,085

**CLASS 181**

113 4,298,086
153 4,298,087
211 4,298,088
213 4,298,089
286 4,298,090

**CLASS 182**

3 4,298,091
70 4,298,092
153 4,298,093
155 4,298,094
184 4,298,095
186 4,298,096
198 4,298,097

**CLASS 184**

105 B 4,298,098

**CLASS 186**

58 4,298,099

**CLASS 187**

29 R 4,298,100

**CLASS 188**

285 4,298,101
319 4,298,102

**CLASS 190**

42 4,298,103
48 4,298,104

**CLASS 192**

0.044 4,298,109
0.094 4,298,113
3.23 4,298,105
3.57 4,298,106
12 D 4,298,107
13 R 4,298,108
48.4 4,298,110
58 B 4,298,111
70.29 4,298,112
129 A 4,298,114

**CLASS 194**

4 F 4,298,115
97 R 4,298,116

**CLASS 198**

367 4,298,117
382 4,298,118

**CLASS 200**

11 C 4,298,776
61.45 R 4,298,777
302 4,298,778
335 4,298,779

**CLASS 201**

8 4,298,435

**CLASS 203**

6 4,298,216

**CLASS 204**

15 4,298,436
70 4,298,437
78 4,298,438
157.1 W 4,298,439
165 4,298,440
180 G 4,298,441
180 P 4,298,442
192 E 4,298,443
192 R 4,298,444
196 4,298,445
224 R 4,298,446
252 4,298,447
299 R 4,298,448
4,298,449

**CLASS 206**

219 4,298,119
329 4,298,120
347 4,298,121
389 4,298,122
396 4,298,123
455 4,298,124
531 4,298,125

**CLASS 208**

8 LE 4,298,450
4,298,451
4,298,452
10 4,298,453
4,298,454
48 AA 4,298,455
86 4,298,456
107 4,298,457
112 4,298,458
120 4,298,459
121 4,298,460
139 4,298,461
4,298,462
189 4,298,463

**CLASS 209**

310 4,298,464

**CLASS 210**

94 4,298,466
96.1 4,298,467
136 4,298,468
168 4,298,469
170 4,298,470
4,298,471
198.2 4,298,472
213 4,298,473
238 4,298,474
266 4,298,475
304 4,298,465
373 4,298,476
674 4,298,477
695 4,298,478

**CLASS 211**

50 4,298,126
126 4,298,127

**CLASS 212**

267 4,298,128

**CLASS 215**

224 4,298,129

**CLASS 219**

10.55 B 4,298,780
69 M 4,298,782
69 W 4,298,781
75 4,298,783
124.02 4,298,784
124.34 4,298,785
216 4,298,786
222 4,298,787
386 4,298,788
406 4,298,789

**CLASS 220**

20 4,298,130
231 4,298,131
288 4,298,132
306 4,298,133
307 4,298,134
371 4,298,135

**CLASS 221**

1 4,298,136
11 4,298,137
115 4,298,138
198 4,298,139
232 4,298,140
251 4,298,141
304 4,298,142

**CLASS 222**

70 4,298,143
256 4,298,144
478 4,298,145
536 4,298,146
601 4,298,147

**CLASS 223**

37 4,298,148

**CLASS 224**

201 4,298,149
243 4,298,150
329 4,298,151

**CLASS 226**

95 4,298,152
97 4,298,153

**CLASS 228**

49 R 4,298,154
114 4,298,155

**CLASS 229**

2.5 R 4,298,156
35 4,298,157
69 4,298,158

**CLASS 233**

7 4,298,159
4,298,160
4,298,161
4,298,162

**CLASS 235**

92 SB 4,298,790
132 R 4,298,791
375 4,298,792
487 4,298,793

**CLASS 236**

46 R 4,298,163
49 4,298,164

**CLASS 237**

8 R 4,298,165

**CLASS 239**

24 4,298,166
129 4,298,167
659 4,298,168

**CLASS 241**

16 4,298,169
222 4,298,170

**CLASS 242**

18 A 4,298,171
47.01 4,298,172
58 4,298,173
128 4,298,174

**CLASS 244**

13 4,298,175
135 A 4,298,176
139 4,298,177
158 R 4,298,178

**CLASS 246**

34 R 4,298,179

**CLASS 249**

135 4,298,180

**CLASS 250**

227 4,298,794
282 4,298,795
328 4,298,796
372 4,298,797
423 R 4,298,798
445 T 4,298,799
4,298,800
447 4,298,801
484 4,298,802
492.2 4,298,803
504 H 4,298,806
562 4,298,807
563 4,298,808

**CLASS 251**

129 4,298,181
251 4,298,182
263 4,298,183
357 4,298,184

**CLASS 252**

8.55 D 4,298,479
8.75 4,298,480
21 4,298,481
25 4,298,482
32.7 HC 4,298,483
46.7 4,298,484
49.6 4,298,486
49.7 4,298,485
75 4,298,487
78.1 4,298,488
78.5 4,298,489
91 4,298,490
95 4,298,491
97 4,298,492
135 4,298,493
174.16 4,298,494
359 A 4,298,496
387 4,298,497
408 4,298,498
414 4,298,499
428 4,298,500
430 4,298,501
431 N 4,298,502
432 4,298,503
441 4,298,504
513 4,298,505
518 4,298,506
643 4,298,495

**CLASS 256**

41 4,298,185
64 4,298,186

**CLASS 260**

4 AR 4,298,507
18 R 4,298,508
29.1 SB 4,298,509
4,298,514
29.2 E 4,298,510
29.2 TN 4,298,511
29.4 R 4,298,512
29.7 H 4,298,513
30.4 N 4,298,515
31.8 HA 4,298,517
31.8 R 4,298,516
32.6 NA 4,298,518
33.8 UA 4,298,519
45.8 R 4,298,520
45.9 QB 4,298,522
45.9 R 4,298,521
112.5 R 4,298,523
239 BF 4,298,524
244.4 4,298,525
314.5 4,298,526
340.5 R 4,298,527
340.7 4,298,528
340.9 R 4,298,529
343.3 R 4,298,530
346.11 4,298,531
346.22 4,298,532
346.75 4,298,533
358 4,298,534
365 4,298,535
378 4,298,536
397.2 4,298,537
397.25 4,298,539
397.4 4,298,538
412.4 4,298,540
429 R 4,298,541
4,298,542
429.7 4,298,543
453 RW 4,298,544
465 H 4,298,545
465.9 4,298,546
505 A 4,298,547

**CLASS 261**

34 R 4,298,548
39 B 4,298,549
69 R 4,298,550
121 R 4,298,551

**CLASS 264**

3 B 4,298,552
11 4,298,553
25 4,298,554
31 4,298,555
46.6 4,298,556
51 4,298,557
65 4,298,558
4,298,559
66 4,298,560
86 4,298,561
103 4,298,562
111 4,298,563
177 R 4,298,564
181 4,298,565
317 4,298,566
516 4,298,567

**CLASS 266**

114 4,298,188
123 4,298,189
156 4,298,190
165 4,298,191
217 4,298,187
218 4,298,192

**CLASS 267**

63 R 4,298,193
64.11 4,298,194

**CLASS 269**

32 4,298,195

**CLASS 272**

52 4,298,196
115 4,298,197

**CLASS 273**

1 GC 4,298,198
1 GD 4,298,199
157 R 4,298,200
183 B 4,298,201
247 4,298,202

**CLASS 277**

152 4,298,203
165 4,298,204
197 4,298,205
205 4,298,206
230 4,298,207

**CLASS 279**

91 4,298,208

**CLASS 280**

11.2 4,298,209
259 4,298,210
297 4,298,211
515 4,298,212
628 4,298,213
735 4,298,214
777 4,297,911

**CLASS 282**

27.5 4,298,215

**CLASS 283**

7 4,298,217

**CLASS 285**

3 4,298,218
24 4,298,219
178 4,298,220
328 4,298,221
341 4,298,222

**CLASS 292**

216 4,298,223

**CLASS 294**

19 R 4,298,224
118 4,298,225

**CLASS 296**

216 4,298,226

**CLASS 297**

58 4,298,227
182 4,298,228

**CLASS 299**

7 4,298,229
33 4,298,230
50 4,298,231
64 4,298,232
91 4,298,233

**CLASS 307**

252 C 4,298,809
252 N 4,298,810
296 R 4,298,811

**CLASS 308**

3.6 4,298,234
26 4,298,235

**CLASS 310**

61 4,298,812

**CLASS 312**

215 4,298,236

**CLASS 313**

229 4,298,813
302 4,298,814
325 4,298,815
330 4,298,816
362.1 4,298,817
417 4,298,818
422 4,298,819
463 4,298,820
477 R 4,298,821
493 4,298,822
497 4,298,823

**CLASS 315**

4 4,298,824
39.51 4,298,825
151 4,298,826
241 R 4,298,827
248 4,298,828
408 4,298,829
411 4,298,830

**CLASS 318**

112 4,298,831
318 4,298,832
561 4,298,833
729 4,298,834

**CLASS 323**

281 4,298,835

**CLASS 324**

71 CP 4,298,836
72.5 4,298,837
117 R 4,298,838
157 4,298,839
365 4,298,840

**CLASS 328**

117 4,298,841

**CLASS 329**

50 4,298,842

**CLASS 330**

9 4,298,843
124 D 4,298,844

**CLASS 331**

94.5 C 4,298,845

**CLASS 333**

32 4,298,846
105 4,298,847
181 4,298,848
193 4,298,849
257 4,298,850

**CLASS 334**

11 4,298,851

**CLASS 335**

6 4,298,852

**CLASS 336**

83 4,298,853

**CLASS 337**

10 4,298,854

**CLASS 338**

35 4,298,855
195 4,298,856

**CLASS 339**

17 L 4,298,237
63 M 4,298,238
66 M 4,298,239
109 4,298,240
147 P 4,298,241
258 R 4,298,242
276 F 4,298,243

**CLASS 340**

52 A 4,298,857
146.3 MA 4,298,858
146.3 Z 4,298,859
365 L 4,298,861
572 4,298,862
573 4,298,863
657 4,298,864
706 4,298,865
713 4,298,866
728 4,298,867
755 4,298,868
782 4,298,869
785 4,298,870
825.04 4,298,860

**CLASS 343**

100 LE 4,298,872
100 SA 4,298,871
4,298,873
112 CA 4,298,875
112 R 4,298,874
756 4,298,876
781 CA 4,298,877
795 4,298,878

**CLASS 350**

3.78 4,298,244
96.29 4,298,245
122 4,298,246
295 4,298,247
310 4,298,248
338 4,298,249
357 4,298,250
428 4,298,251
470 4,298,252

**CLASS 351**

17 4,298,253
50 4,298,254

**CLASS 352**

85 4,298,255

**CLASS 354**

23 D 4,298,256
4,298,257
25 4,298,258

4,298,259
50 4,298,260
139 4,298,261
4,298,262
234 4,298,263
242 4,298,264
246 4,298,265
286 4,298,266
304 4,298,267

**CLASS 355**

3 R 4,298,269
3 SC 4,298,268
3 SH 4,298,270
8 4,298,271
28 4,298,272
61 4,298,273
71 4,298,274
4,298,275
72 4,298,276
76 4,298,277
85 4,298,278
133 4,298,279

**CLASS 356**

5 4,298,280
138 4,298,281
237 4,298,282
351 4,298,283
368 4,298,284
376 4,298,285
381 4,298,286

**CLASS 357**

22 4,298,879
38 4,298,880
4,298,881
4,298,882
72 4,298,883

**CLASS 358**

26 4,298,884
39 4,298,885
74 4,298,886
113 4,298,887
140 4,298,888
148 4,298,889
158 4,298,890
183 4,298,891
190 4,298,892
4,298,893
229 4,298,894
284 4,298,895

**CLASS 360**

11 4,298,896
39 4,298,897
67 4,298,898
122 4,298,899

**CLASS 361**

127 4,298,900
178 4,298,901
248 4,297,947
328 4,298,902
386 4,298,903
4,298,904
4,298,905
433 4,298,906

**CLASS 362**

4 4,298,907
14 4,298,908
18 4,298,909
35 4,298,910
4,298,911
66 4,298,912
103 4,298,913
112 4,298,914
124 4,298,915
127 4,298,916
157 4,298,917
217 4,298,918
226 4,298,919
281 4,298,920
346 4,298,921
376 4,298,922
392 4,298,923

**CLASS 363**

46 4,298,924
131 4,298,925
132 4,298,926

**CLASS 364**

200 4,298,927
4,298,928
4,298,929
4,298,930
4,298,931
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4,298,934
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426 4,295,940
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557 4,298,946
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603 4,298,948
706 4,298,949
726 4,298,950
752 4,298,951
786 4,298,952
825 4,298,953
900 4,298,954
4,298,955
4,298,956
4,298,957
4,298,958
4,298,959

**CLASS 365**

179 4,298,961
182 4,298,962
210 4,298,960

**CLASS 366**

4 4,298,287
8 4,298,288
196 4,298,289

**CLASS 367**

4 4,298,963
4,298,964
4,298,965
50 4,298,966
57 4,298,967
59 4,298,968
76 4,298,969
82 4,298,970

**CLASS 368**

76 4,297,838
204 4,298,971
222 4,298,972
276 4,298,973

**CLASS 369**

45 4,298,974
94 4,298,975
282 4,298,976

**CLASS 370**

62 4,298,977
92 4,298,978
104 4,298,979

**CLASS 371**

25 4,298,980
30 4,298,982
37 4,298,981

**CLASS 375**

12 4,298,983
40 4,298,984
82 4,298,985
84 4,298,986
106 4,298,987

**CLASS 376**

108 4,298,804
111 4,298,805
247 4,298,430
286 4,298,433
364 4,298,434
365 4,298,432

**CLASS 400**

3 4,298,290

**CLASS 403**

205 4,298,291

**CLASS 404**

10 4,298,292
98 4,298,293

**CLASS 405**

37 4,298,294
52 4,298,295
146 4,298,296

**CLASS 411**

262 4,298,297
342 4,298,298
514 4,298,299

**CLASS 414**

2 4,298,300
24.6 4,298,301
126 4,298,302
401 4,298,303
492 4,298,304
498 4,298,305
525 R 4,298,306
676 4,298,307
730 4,298,308
745 4,298,309

**CLASS 415**

1 4,298,310
80 4,298,311
118 4,298,312

**CLASS 416**

98 4,298,313

**CLASS 417**

299 4,298,314
300 4,298,315
310 4,298,316

**CLASS 418**

43 4,298,317
61 B 4,298,318
132 4,298,319

**CLASS 422**

16 4,298,568
27 4,298,569
64 4,298,570
65 4,298,571
68 4,298,572
94 4,298,573
97 4,298,574
135 4,298,576

**CLASS 423**

6 4,298,577
7 4,298,578
11 4,298,579
40 4,298,580
58 4,298,581
4,298,582
167 4,298,583
242 4,298,584
279 4,298,585
339 4,298,586
350 4,298,587
359 4,298,588
4,298,589

**CLASS 424**

1 4,298,590
4,298,591
4,298,592
4,298,593
19 4,298,594
78 4,298,595
88 4,298,596
92 4,298,597
101 4,298,598
119 4,298,599
120 4,298,600
128 4,298,601
200 4,298,602
230 4,298,603
240 4,298,604
246 4,298,605
4,298,606
4,298,607
249 4,298,608
250 4,298,609
256 4,298,610
261 4,298,611
267 4,298,612
274 4,298,613
279 4,298,614
285 4,298,615
4,298,616
298 4,298,617

**CLASS 425**

110 4,298,320
120 4,298,321
147 4,298,322
162 4,298,323
174.8 E 4,298,324
192 R 4,298,325
219 4,298,326
344 4,298,327
376 A 4,298,328
382 N 4,298,329
392 4,298,330
393 4,298,331
570 4,298,332

**CLASS 426**

36 4,298,618
43 4,298,619
44 4,298,620
55 4,298,621
254 4,298,622
335 4,298,623
532 4,298,624
572 4,298,625
600 4,298,626
637 4,298,627
656 4,298,628

**CLASS 427**

39 4,298,629
44 4,298,630
130 4,298,631
160 4,298,632
172 4,298,633
183 4,298,634
247 4,298,635
304 4,298,636
358 Re.30,789
372.2 4,298,637
385.5 4,298,638
386 4,298,639

**CLASS 428**

31 4,298,640
36 4,298,641
40 4,298,642
85 4,298,643
91 4,298,644
110 4,298,645
159 4,298,646
167 4,298,647
195 4,298,648
198 4,298,649
306 4,298,650
307 4,298,651
323 4,298,652
378 4,298,653
407 4,298,654
412 4,298,655
414 4,298,656
416 4,298,657
425.1 4,298,658
592 4,298,659
599 4,298,660
623 4,298,661

**CLASS 429**

50 4,298,662
4,298,663
191 4,298,664
197 4,298,665
206 4,298,666
248 4,298,667
250 4,298,668

**CLASS 430**

55 4,298,669
67 4,298,670
108 4,298,672
128 4,298,671
204 4,298,673
213 4,298,674
4,298,675
221 4,298,676
244 4,298,677
281 4,298,678
4,298,679
300 4,298,680
466 4,298,681
533 4,298,682
569 4,298,683
616 4,298,684

**CLASS 431**

11 4,298,333
24 4,298,334
25 4,298,335
264 4,298,336
285 4,298,337
352 4,298,338

**CLASS 432**

15 4,298,339
58 4,298,340
64 4,298,341

**CLASS 435**

7 4,298,685
4,298,686
4,298,687
14 4,298,688
34 4,298,689
80 4,298,690
101 4,298,691
119 4,298,692
305 4,298,693

**CLASS 455**

182 4,298,988
183 4,298,989
325 4,298,990

**CLASS 474**

110 4,298,342
255 4,298,343

**CLASS 501**

15 4,298,388
32 4,298,390
77 4,298,389
80 4,298,386
89 4,298,391
92 4,298,387
105 4,298,385

**CLASS 518**

704 4,298,694
720 4,298,695

**CLASS 521**

26 4,298,696
27 4,298,697
4,298,698
31 4,298,699
32 4,298,700
51 4,298,701
79 4,298,702
88 4,298,703
4,298,704
4,298,705
92 4,298,706
95 4,298,707
115 4,298,708
169 4,298,709

**CLASS 525**

5 4,298,710
40 4,298,711
74 4,298,712
323 4,298,713
330 4,298,714
340 4,298,715

**CLASS 526**

65 4,298,716
124 4,298,717
125 4,298,718
255 4,298,719
262 4,298,720
348 4,298,721
348.6 4,298,722

**CLASS 528**

271 4,298,723
302 4,298,724

**CLASS 536**

1 4,298,725
4 4,298,726
10 4,298,727
96 4,298,728
102 4,298,729
119 4,298,730

**CLASS 544**

11 4,298,731
20 4,298,732
106 4,298,733
251 4,298,734
257 4,298,735
274 4,298,736
360 4,298,737

**CLASS 546**

22 4,298,738
158 4,298,739
226 4,298,740
272 4,298,741

**CLASS 548**

152 4,298,742
203 4,298,743
240 4,298,744
313 4,298,745
315 4,298,746
318 4,298,747
347 4,298,748
377 4,298,749

**CLASS 549**

4 4,298,750
11 4,298,751
42 4,298,752

**CLASS 556**

415 4,298,753

**CLASS 560**

121 4,298,754
214 4,298,755
231 4,298,756
4,298,757
240 4,298,758

**CLASS 562**

485 4,298,759
506 4,298,760

**CLASS 568**

44 4,298,761
433 4,298,762
479 4,298,763
618 4,298,764
754 4,298,765
862 4,298,766

# CLASSIFICATION OF DESIGNS

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| D2— | 318 | 261,570 | | | 261,591 | | 337 | 261,615 | | | 261,636 | | 123 | 261,658 | | 41 | 261,679 |
| D3— | 38 | 261,571 | | 45 | 261,592 | | 415 | 261,616 | | 209 | 261,637 | D16— | 31 | 261,659 | | 53 | 261,680 |
| | 71 | 261,572 | | 78 | 261,593 | | 418 | 261,613 | | | 261,638 | | | 261,660 | | 64 | 261,681 |
| D6— | 4 | 261,573 | | 94 | 261,594 | | 432 | 261,617 | D13— | 2 | 261,639 | | | 261,661 | D25— | 16 | 261,682 |
| | 29 | 261,574 | | 99 | 261,595 | | 433 | 261,618 | | 4 | 261,640 | | 104 | 261,662 | D26— | 2 | 261,683 |
| | 35 | 261,575 | | 109 | 261,596 | | 437 | 261,619 | | 38 | 261,641 | D17— | 10 | 261,663 | | 63 | 261,684 |
| | 41 | 261,576 | | 128 | 261,597 | | 438 | 261,620 | D14— | 5 | 261,643 | D18— | 3 | 261,664 | | 87 | 261,685 |
| | 42 | 261,577 | | | 261,598 | | 456 | 261,621 | | 11 | 261,644 | D19— | 77 | 261,665 | | 93 | 261,686 |
| | | 261,578 | | | 261,599 | D10— | 6 | 261,622 | | 30 | 261,642 | | 92 | 261,668 | | | 261,687 |
| | | 261,579 | | 129 | 261,600 | | 46 | 261,623 | | | 261,645 | D21— | 6 | 261,667 | | 102 | 261,688 |
| | 66 | 261,580 | | 207 | 261,603 | | | 261,624 | | 53 | 261,647 | | 13 | 261,666 | D27— | 3 | 261,689 |
| | 125 | 261,581 | | 212 | 261,604 | | 65 | 261,625 | | | 261,648 | | | 261,669 | | | 261,690 |
| | 181 | 261,582 | | | 261,605 | | 69 | 261,626 | | | 261,649 | | 64 | 261,670 | D28— | 8.1 | 261,691 |
| | 189 | 261,583 | D8— | 21 | 261,606 | | 79 | 261,627 | | 70 | 261,650 | | 109 | 261,671 | | 35 | 261,692 |
| | 198 | 261,584 | | 25 | 261,607 | | 106 | 261,628 | | 73 | 261,651 | | 137 | 261,672 | | 68 | 261,693 |
| | 234 | 261,585 | | 27 | 261,608 | | | 261,629 | | 96 | 261,652 | D22— | 27 | 261,673 | D32— | 32 | 261,655 |
| D7— | 16 | 261,586 | | 74 | 261,609 | | 121 | 261,630 | | 110 | 261,653 | D23— | 37 | 261,674 | | 40 | 261,601 |
| | | 261,587 | | 82 | 261,610 | D11— | 131 | 261,631 | | 114 | 261,646 | | 97 | 261,675 | | 55 | 261,602 |
| | 38 | 261,588 | | 89 | 261,611 | | 157 | 261,632 | D15— | 5 | 261,654 | D24— | 8 | 261,676 | D34— | 24 | 261,634 |
| | | 261,589 | | 104 | 261,612 | | 162 | 261,633 | | 111 | 261,656 | | 10 | 261,677 | D47— | 6 E | 261,694 |
| | 40 | 261,590 | D9— | 311 | 261,614 | D12— | 147 | 261,635 | | 118 | 261,657 | | 26 | 261,678 | | | |

# CLASSIFICATION OF PLANTS

| | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P.— | 47 | 4,784 | | 68 | 4,785 | | 74 | 4,786 | | | | | | | | | |

# DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

| | | | | | | | | | | | | | | | | | |
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| 56— | 15.6 | T101,206 | 71— | 29 | T101,203 | 156— | 643 | T101,201 | 261— | 41 D | T101,202 | 264— | 523 | T101,205 | 376— | 221 | T101,204 |

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## PATENTS

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